SERVICE MANUAL

HEAT PUMP WATER HEATER

SWH-15/190TL
SWH-35/300TL, SWH-35/300TSL

sinclair
AIR CONDITIONING

Sanitary Water Heater

Technical Manual

Applicable Model:

SWH-15/190TL

SWH-35/300TL

SWH-35/300TSL

Sinclair reserves the right to discontinue, or change at any time, specifications or designs without notices and without incurring obligations.

Measurements

Model	Dimension (mm: D x H)	Net weight / Gross weight (kg)	Power Supply
SWH-15/190TL	Φ568×1640	96/110	220~240V-1ph-50Hz
SWH-35/300TL, SWH-35/300TSL	Φ650×1,920	123/150	220~240V-1ph-50Hz

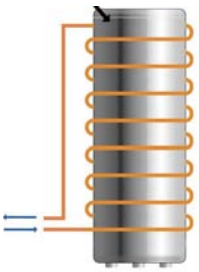
External Appearance

SWH-15/190TL

SWH-35/300TL, SWH-35/300TSL

Features

1 Safety



a. Complete isolation between water and electricity. No electric shock problem, more safety.

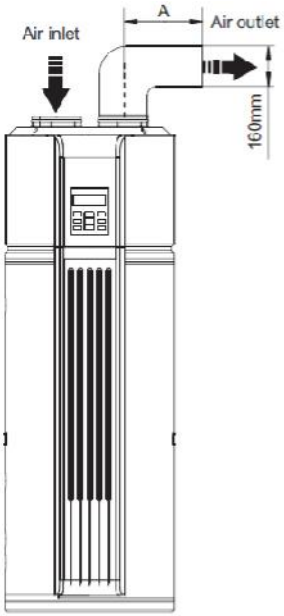
b. No fuel tubes and storage, no potential danger from oil leakage, fire, explosion etc.

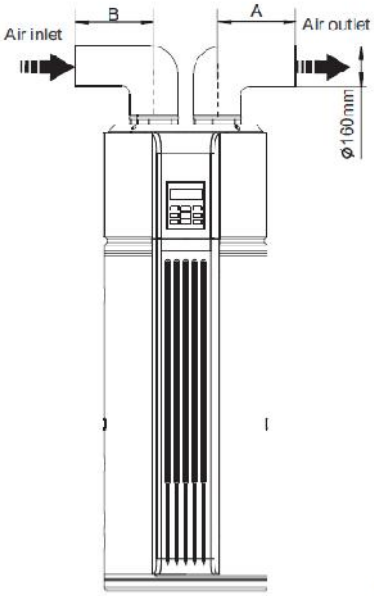
c. No cross contamination potential, the condenser coil wrapped around the stainless steel inner tank

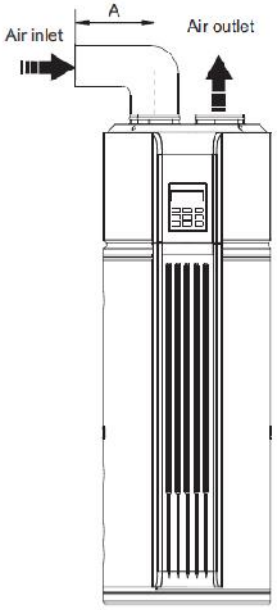
2 Max. outlet water Temperature: 70℃.

The system is adopted innovative heating methods: combined the Electric heating and Heat Pump heating properly, made the water be heated stably and quickly.

3 Flexible installation achieved by long air intake/outlet duct with pressure







4 Automatic Control:

Automatic start-up and shutdown, automatic defrosting by revising refrigerant cycle. Save you much extra operation.

5 High Efficiency and Energy Saving.

The unit adopts heat pump principle, which absorbs heat from outdoor air and produce heat water, thermal efficiency can be approximately 3.6 (under the condition A15/12 W15/45)

6 All-the-weather Running.

Within the temperature range from -30 to 43℃, it will not be affected by night, cloudy sky, rain even snow whether.

Specifications

Model			SWH-15/190T	
Running mode			Economy	E-heater
Running ambient temp.		℃	-7 ~ 43	-30 ~ 43
Output water Temp.		℃	Default 55℃,38℃ ~ 70℃	
Power supply		Ph-V-Hz	1-220 ~ 240-50	
Storage size		L	190	
Water heating Capacity		kW	1.50	3.00
Cop		kW/kW	3.60	1.00
Max. current		A	6.5	13.0
Ambient temp.		℃	-30 ~ 43	
Dimension (D×H)		mm	Φ568×1640	
Packing (W×H×D)		mm	700×1740×720	
Net/gross weight		kg	96/110	
Noise level		dB(A)	38	
Refrigerant type/Charged volume		kg	R134a/0.95	
Refrigerant design pressure		MPa	3.0/ 1.2	
Tank design pressure		MPa	0.15 ~ 1.0	
Throttling type			thermal expansion valve	
System protection			TCO1, TCO2, PT valve, automatic defrosting, over-load protector temp. electric leakage protector etc.	
Air flow volume		m³/h	414/355/312	
Compressor	Model		PJ125G1C-4DZDE	
	Type		Rotary	
	Brand		GMCC	
	Capacity	Btu/h	4740	
	Input	kW	0.515	
Fan motor	Model		YDK12-6A	
	Brand		welling	
	Input	w	28	
	Speed	r/min	900/815/680	
Water pipeline	Water inlet pipe	mm	ΦDN20	
	Water outlet pipe	mm	ΦDN20	
	Drainage pipe	mm	ΦDN20	
	PT valve joint	mm	ΦDN20	
	Max. pressure	MPa	1.2	
	Design pressure	MPa	0.15 ~ 1.0	
	Heat exchanger		Dividing wall type heat exchanger	
E-heater		kW	3.0	
Hot water yield		m³/h	0.045	0.075
Loading Quantity	20'/40'/40H	Pcs	24/51/51	

Remark:

1. The test conditions: outdoor temp. 15/12℃(DB/WB), inlet water temp. 15℃, outlet water temp.45℃.
2. The specification may be changed for product improvement, please refer to the nameplate.

Model			SWH-35/300TL, SWH-35/300TSL	
Running mode			Economy	E-heater
Running ambient temp.		℃	-7 ~ 43	-30 ~ 43
Outlet water Temp.		℃	Default 55℃,38℃ ~ 60℃	
Power supply		Ph-V-Hz	1-220 ~ 240-50	
Storage size		L	300	
Water heating	Capacity	kW	3.00	3.00
	Cop	kW/kW	3.60	1.00
	Max. current	A	6.5	13.0
Ambient temp.		℃	-30 ~ 43	
Unit	Dimension (D×H)	mm	Φ650×1,920	
	Packing (W×H×D)	mm	750×2,150×780	
	Net/gross weight	kg	123/150	
Noise level		dB(A)	48	
Refrigerant type/quantity		kg	R134a/1.2	
Refrigerant design pressure		MPa	3.0/1.2	
Tank design pressure		MPa	1	
Throttling type			Electric expansion valve	
System protection			TCO1, TCO2, PT valve, automatic defrosting, over-load protector temp. electric leakage protector etc.	
Air flow		m³/h	414/355/312	
Compressor	Model		RB233GRDC	
	Type		Rotary	
	Brand		Guangzhou Mitsubishi electric	
	Capacity	Btu/h	9500	
	Input	kW	0.9	
Fan motor	Model		YDK30-6R	
	Brand		welling	
	Input	w	68	
	Speed	r/min	620/530/465	
Water pipeline	Water inlet pipe	mm	DN20	
	Water outlet pipe	mm	DN20	
	Drainage pipe	mm	DN20	
	PT valve joint	mm	DN20	
Max. pressure		MPa	1.2	
Design pressure		MPa	1	
Heat exchanger			Dividing wall type heat exchanger	
Solar heat exchanger	Water inlet pipe	mm	DN20	
	Water outlet pipe	mm	DN20	
	Heat exchanger		Stainless steel SUS316L	
	Dim.×Length	mm	22×10000	
	Max. pressure	MPa	0.7	
E-heater		kW	3	
Hot water yield		m³/h	0.086	
Loading Quantity	20'/40'/40H	Pcs	21/47/47	

Remark:

1. The test conditions: outdoor temp. 15/12℃(DB/WB), inlet water temp. 15℃, outlet water temp.45℃.
2. The specification may be changed for product improvement, please refer to the nameplate.

Operation range

E-heater running ambient temperature range: -30~45℃.

Heat pump running ambient temperature range: -7~43℃.

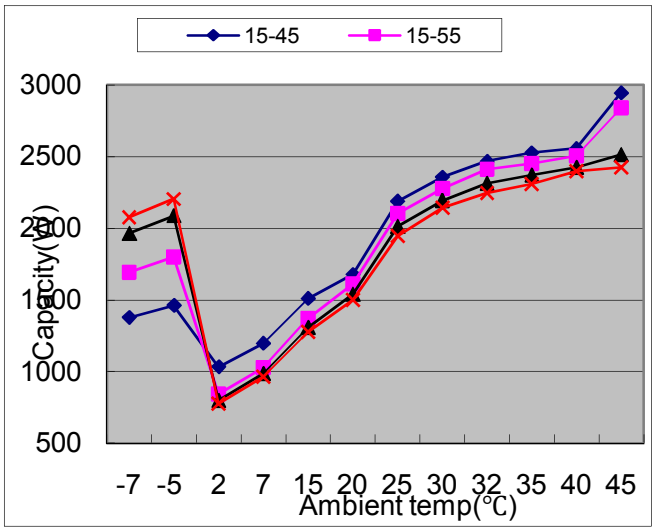
Water temperature limits:

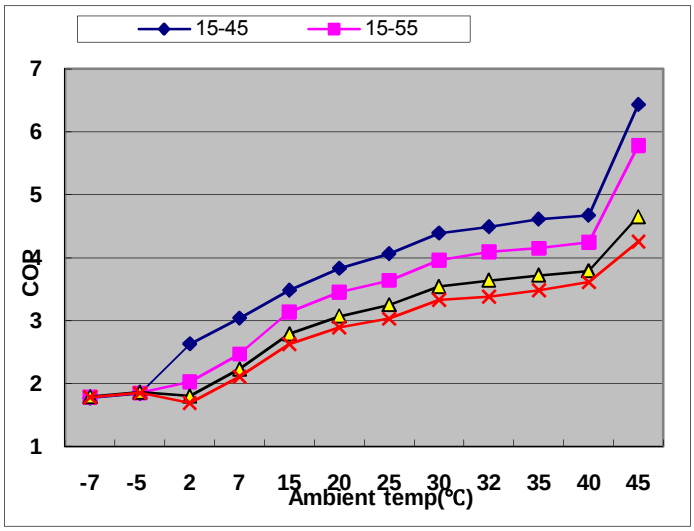
Ambient temp. T4 / Model		T4 < -7	-7≤T4 < -2	-2≤T4 < 2	2≤T4 < 7	7≤T4 < 43	43≤T4
SWH-15/190T	Max temp (Heat pump)	—	45	60	70	70	—
	Max temp (E-heater)	70	70	70	70	70	70
SWH-35/300TL, SWH-35/300TSL	Max temp (Heat pump)	—	42	47	55	60	—
	Max temp (E-heater)	60	60	60	60	60	60

Note：Modes will be automatically selected by the unit. manually mode selection is unavailable

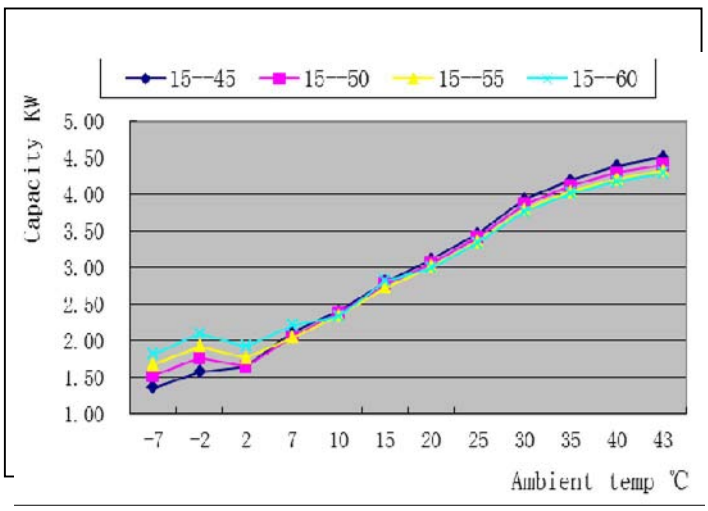
Capacity & COP table

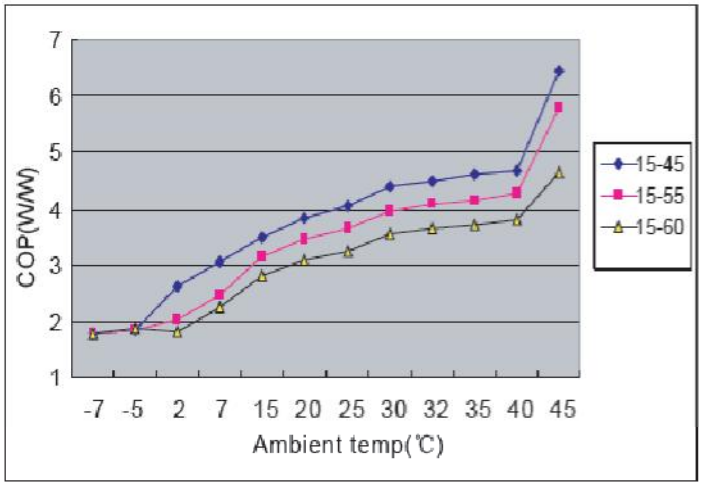
Model: SWH-15/190T





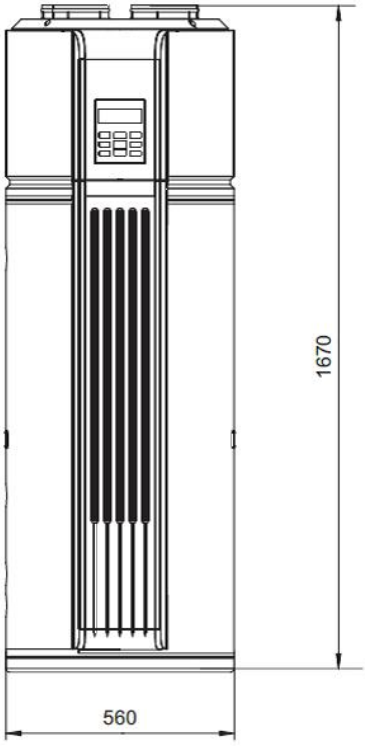
Model: SWH-35/300TL, SWH-35/300TSL

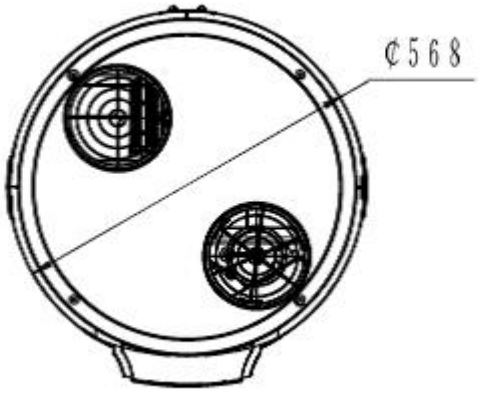




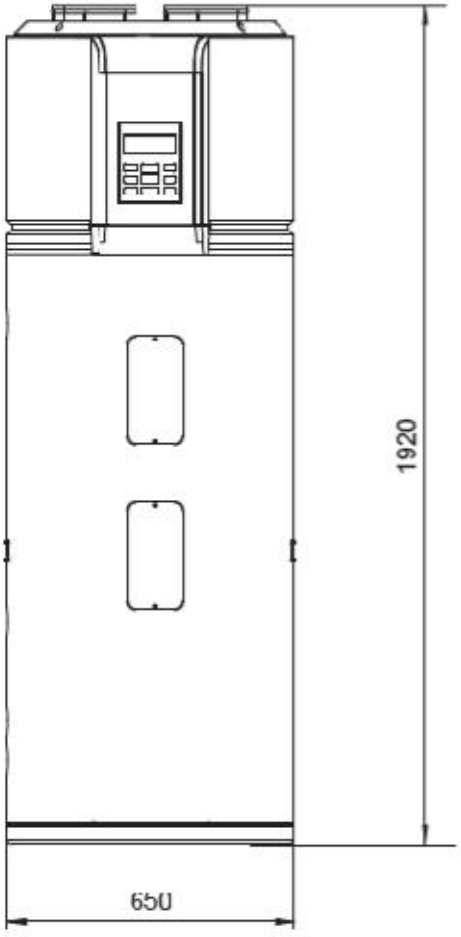
Dimensions

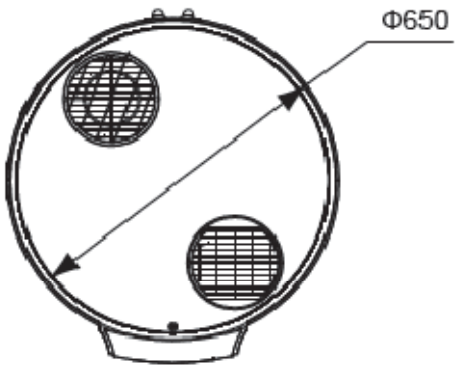
Model ：SWH-15/190TL



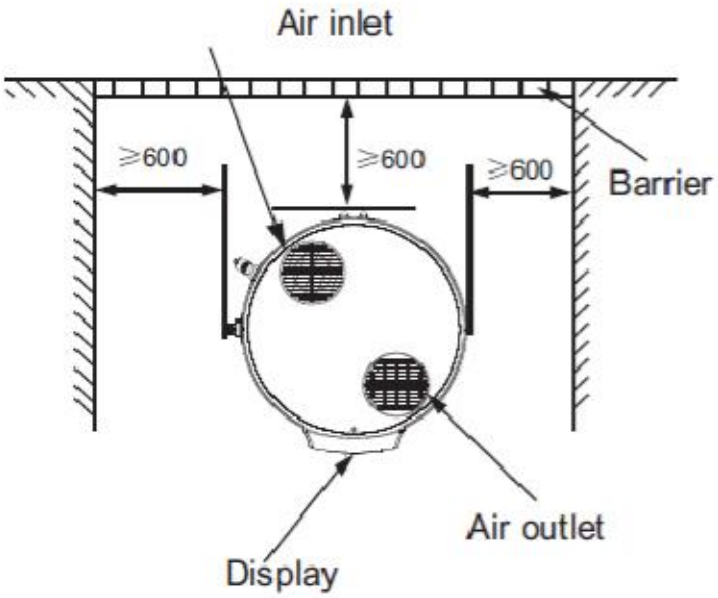


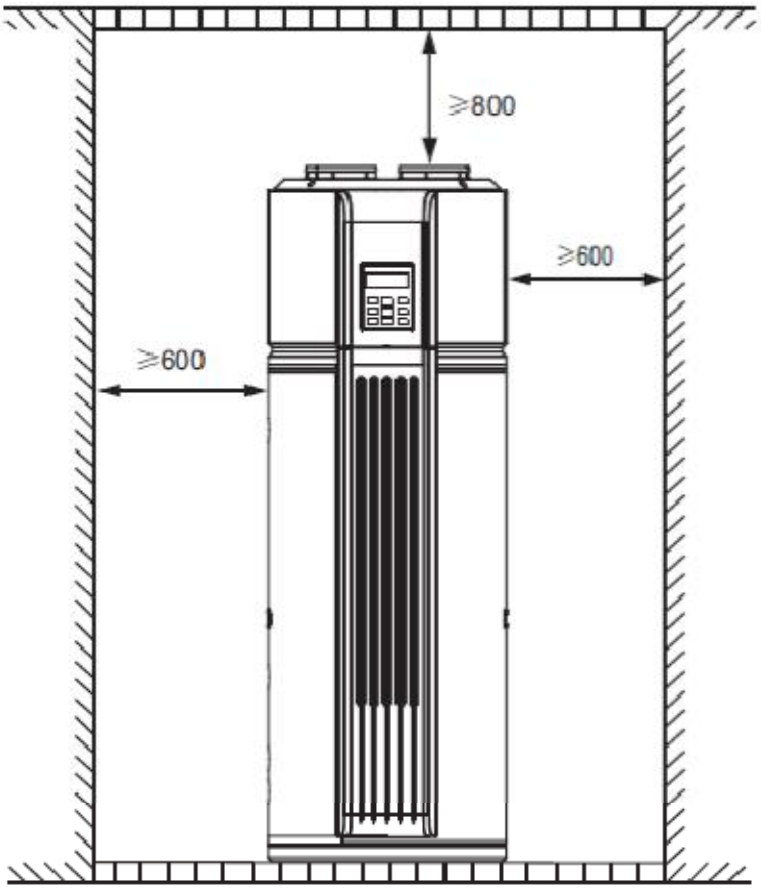
Model ：SWH-35/300TL, SWH-35/300TSL





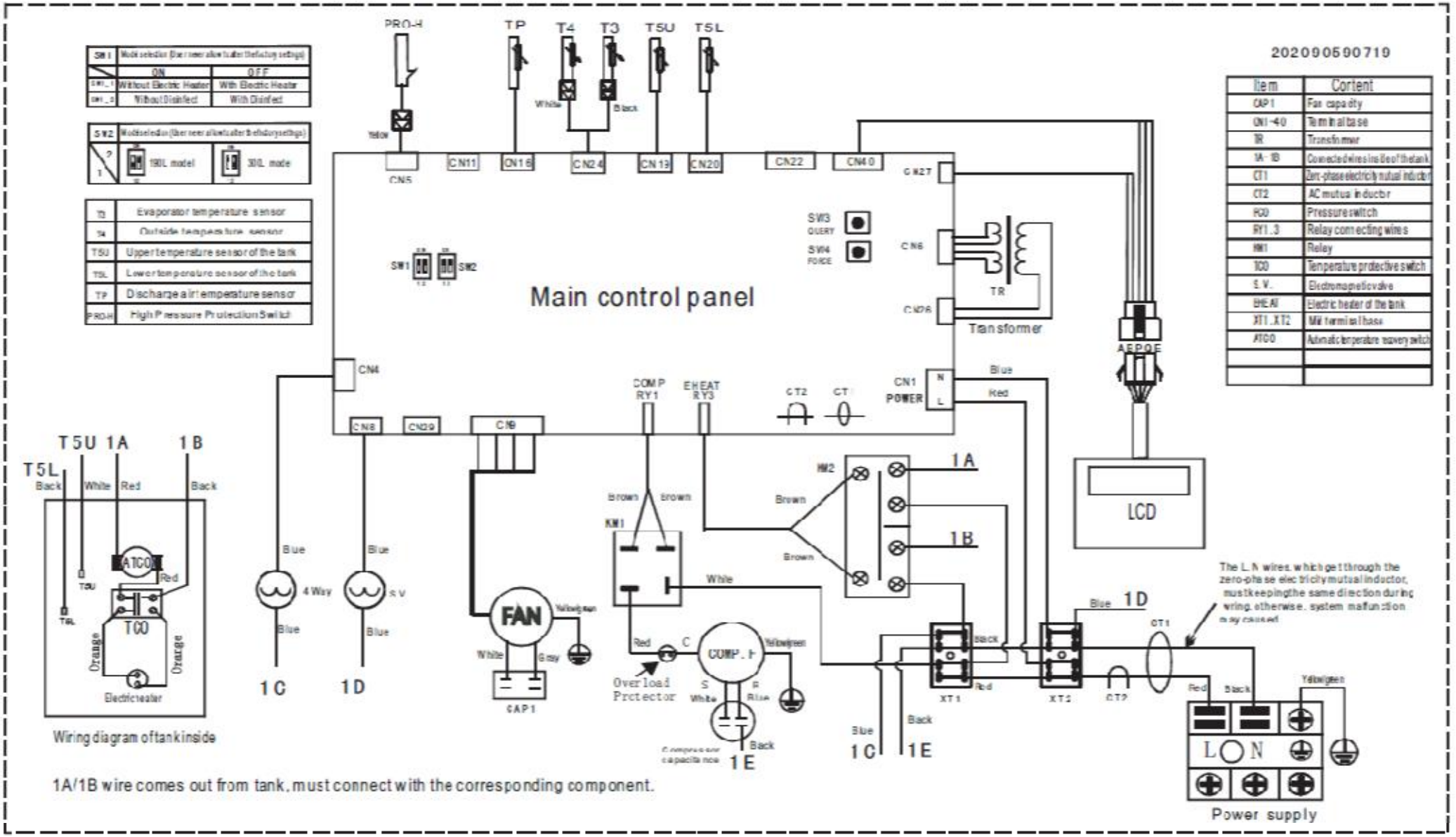
Service Space



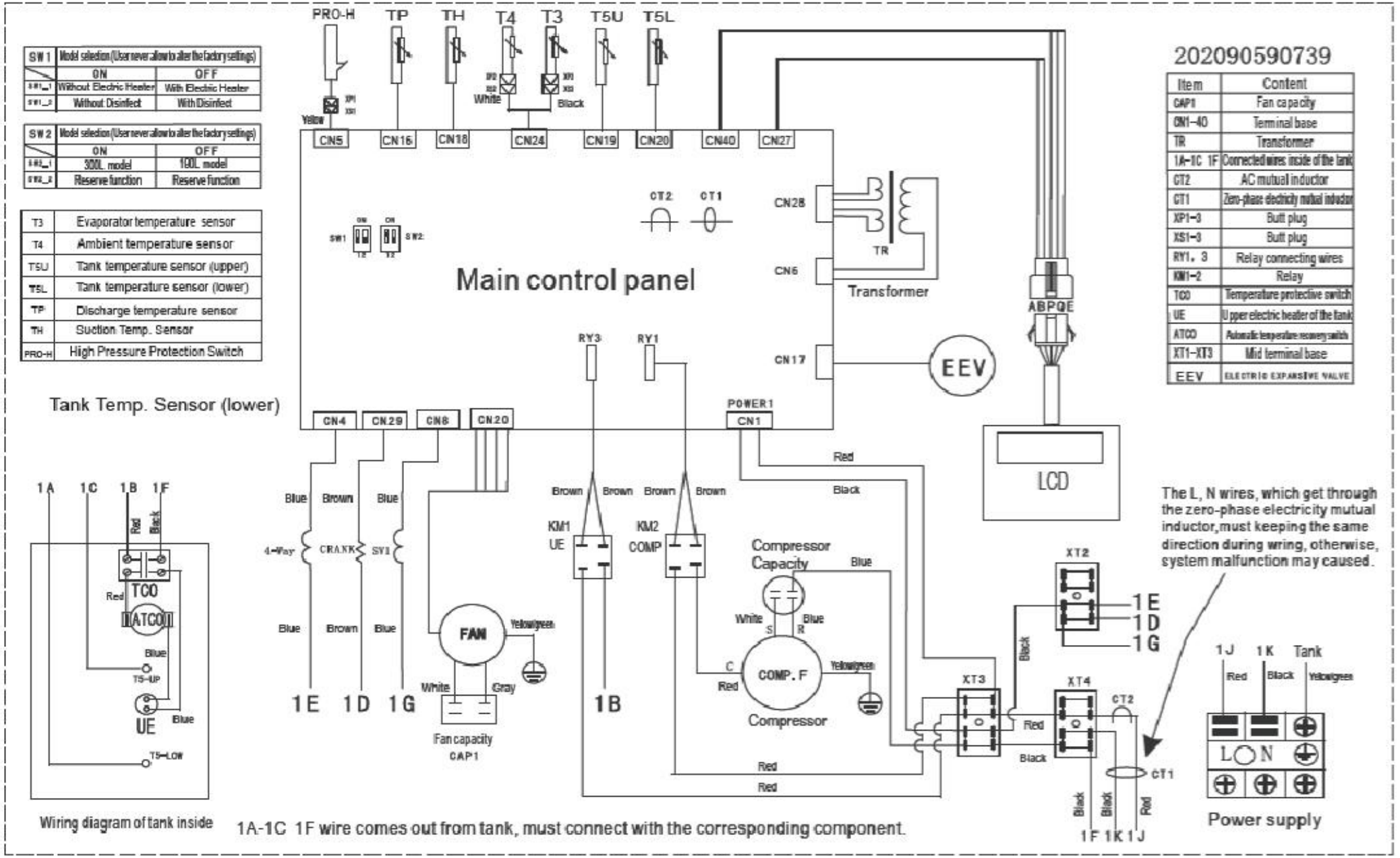


Wiring Diagrams

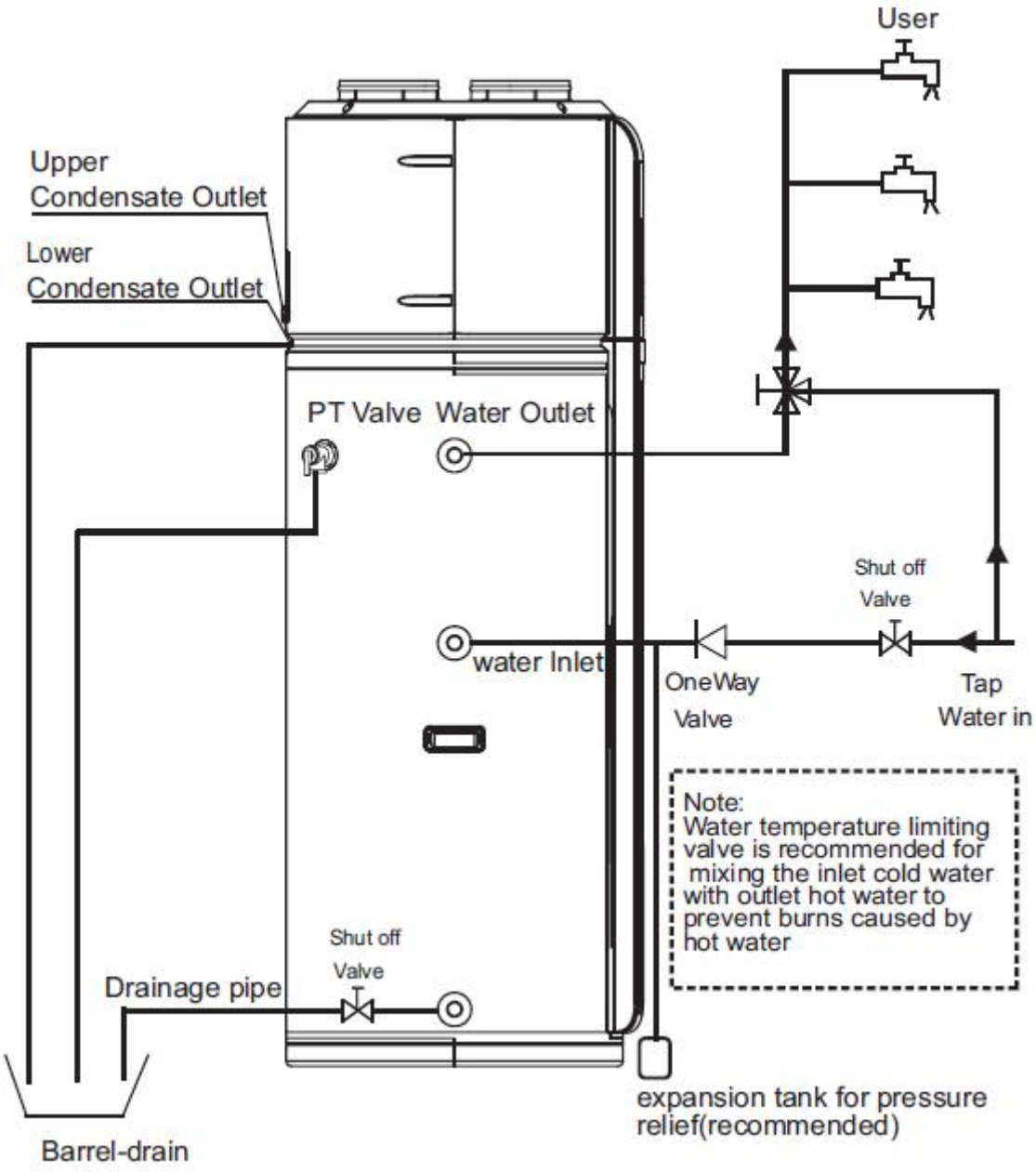
Model：SWH-15/190TL



Model：SWH-35/300TL, SWH-35/300TSL

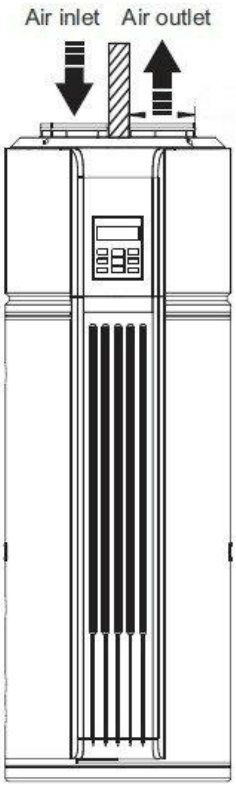


Piping Diagrams

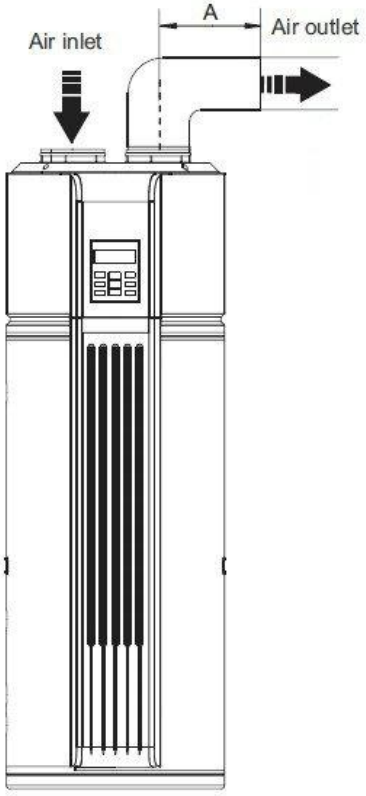


Duct connection

A: Air inlet and outlet without duct

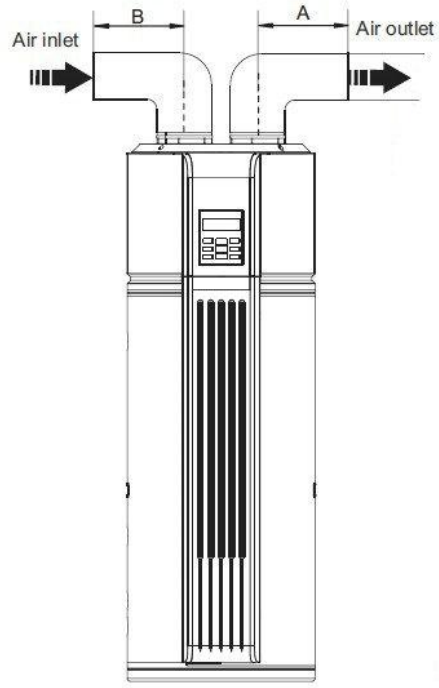


B: Only air outlet with canvas, A≤5m

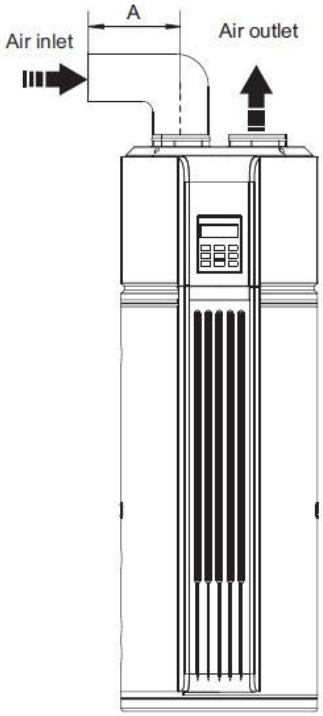


It is recommended to install unit by this way in the winter where there is other heat source in the room.

C: Air inlet and outlet with duct. (A+B≤5m)



D: Only air inlet with canvas A≤5m



It is recommended to install unit by this way in summer that could charge fresh air into room

Precautions

To prevent injury to the user or other people and property damage, the following instructions must be followed. Incorrect operation due to ignoring of instructions may cause harm or damage.

The safety precautions listed here are divided into two categories. In either case, important safety instructions are listed to which close attention must be paid.

WARNING

Failure to observe a warning may result in death.

CAUTION

Failure to observe a caution may result in injury or damage to the equipment.

WARNING

- The unit must be earthed effectively.
- A creepage breaker must be installed adjacent to the power supply
- Do not remove, cover or deface any permanent instructions, labels or the data label from either the outside of the unit or inside of unit panels.
- Ask qualified person to perform the installation of this unit in accordance with local national regulations and this manual.
- Improper installation may result in water leakage, electric shock or fire.
- Do not insert fingers, rods or other objects into the air inlet or outlet. When the fan is rotating at high speed, it will cause injury.
- Never use a flammable spray such as hair spray, lacquer paint near the unit. It may cause a fire.
- Ask qualified person for relocating, repairing and maintaining the unit instead of doing by yourself.
- Improper installation may result in water leakage, electric shock or fire.
- Electric connection work should obey the instructions of local power company, local electric utility and this manual.
- Never use the wire and fuse with wrong rated current, otherwise unit may break down and cause fire furthermore
- The appliance should not be used by children without supervision .If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person.
- DISPOSAL:

  Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.

  Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.

  Contact your local government for information regarding the collection systems available.
- If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

CAUTION

- The earthing pole of socket must be grounded well, the rated current should be no less than 15A, make sure that power supply socket and plug are dry enough and connected tightly.
- How to check the power supply socket and plug are qualified?

- Turn on power supply and keep the unit running for a half hour, then turn off power supply and plug out, check whether the socket and plug is hot or not.
- Before cleaning, be sure to stop the operation and turn the breaker off or pull out the power plug.
- Otherwise, an electric shock and injury may be caused.
- Water temperature over 50℃ can cause severe burns instantly or death from scalds. Children, disabled and elderly are at highest risk of being scalded. Feel water before bathing or showering.
- Water temperature limiting valves are recommended.
- Do not operate the unit with a wet hand. An electric shock may be caused.
- The installation height of power supply should be over 1.8m, if there is any water spattered, separate the power supply from water.
- A one-way valve must be installed on the water inlet side, which is available from accessories, see manual "accessories" part.
- It's normal if some water drops from the hole of PT valve during operation. But, if there is a great amount of water, call your service agent for instructions.
- After a long term use, check the unit base and fittings. If damaged, the unit may sink and result in injury.
- Arrange the drain pipe to ensure smooth draining. Improper drainage work may cause wetting of the building, furniture etc.
- Do not touch the inner parts of the controller.
- Do not remove the front panel. Some parts inside are dangerous to touch, otherwise a machine malfunction may be caused.
- Do not turn off the power supply.

Installation information

- Enough space for installation and maintenance shall be preserved.
- The air inlet and outlet should be free from obstacles and strong wind.
- The base surface should be flat, surface should be inclined no more than 2°and able to bear weight of the unit and suitable for installing the unit without increasing noise or vibration.
- The operation noise and air flow expelled shall not affect neighbors.
- No flammable gas is leaked nearby.
- It is convenient for piping and wiring.
- If it is installed in indoor space, it might cause indoor temp decreased and noise, Please take preventive measures for this.
- If the unit has to be installed on a metal part of building, make sure the well electric insulation which should meet the relevant local electric standard.

CAUTION

- The ambient air temperature must also be considered when installing this unit, in Heat pump mode the ambient air temperature must be above -7℃ and below 43℃if the ambient air temperature falls outside these upper and lower limits, the electrical elements will activated to meet the hot water demand and the heat pump does not operate.
- The unit should be located in an area not subject to freezing temperatures. The unit located in unconditioned space (i.e. garages, basements, etc.) may require the water piping, condensate piping, and drain piping to be insulated to shelter against freezing.
- Installing the equipment in any of the following places may lead to malfunction of the equipment (if it is inevitable, consult the supplier):

1) The site contains mineral oils such as cutting lubricant.
2) Seaside where the air contains much salt.

3) Hot spring area where corrosive gases exist, e.g., sulfide gas.
4) Factories where the power voltage fluctuates seriously.
5) Inside a car or cabin.
6) Place like kitchen where oil permeates.
7) Place where strong electromagnetic waves exist.
8) Place where flammable gases or materials exist.
9) Place where acid or alkali gases evaporate.
10) Other special environments.

■ Precautions before installation

1) Decide the correct way of conveying the equipment.
2) Try to transport this equipment with the original package.
3) If the unit has to be installed on a metal part of the building, electric insulation must be installed, and the installation must meet the relevant technical standards for electric devices.

■ Installation space

Before installing the unit, reserve the space of maintenance .

WARNING

■ Ask your supplier to install the air source heat pump water heating units. Incomplete installation performed by yourself may result in a water leakage, electric shock, or fire.
■ The place without direct sunlight and other heat supplies. If there's no way to avoid these, please install a covering.
■ The unit must be securely fixed, or else, noise and shaking will be resulted.
■ Make sure that there's no remora around the unit.
■ In the place where there is strong wind like seashore, fix the unit in the location protected from the wind.
■ Carry the unit onto the site

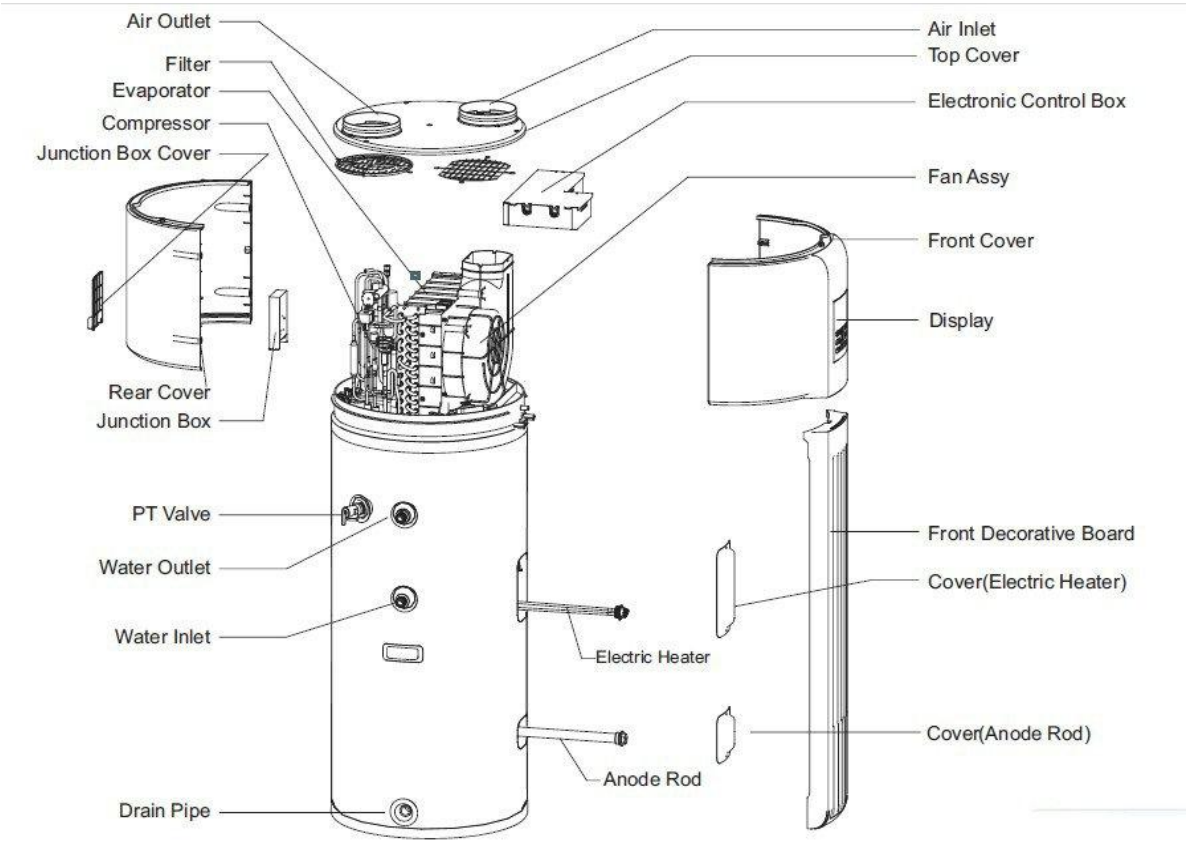
1) In order to avoid scratch or deformation of the unit surface, apply guard boards to the contacting surface.
2) No contact of fingers and other things with the vanes.
3) Don't incline the unit more than 45° in moving, and keep it vertical when installing.

■ Install the unit.

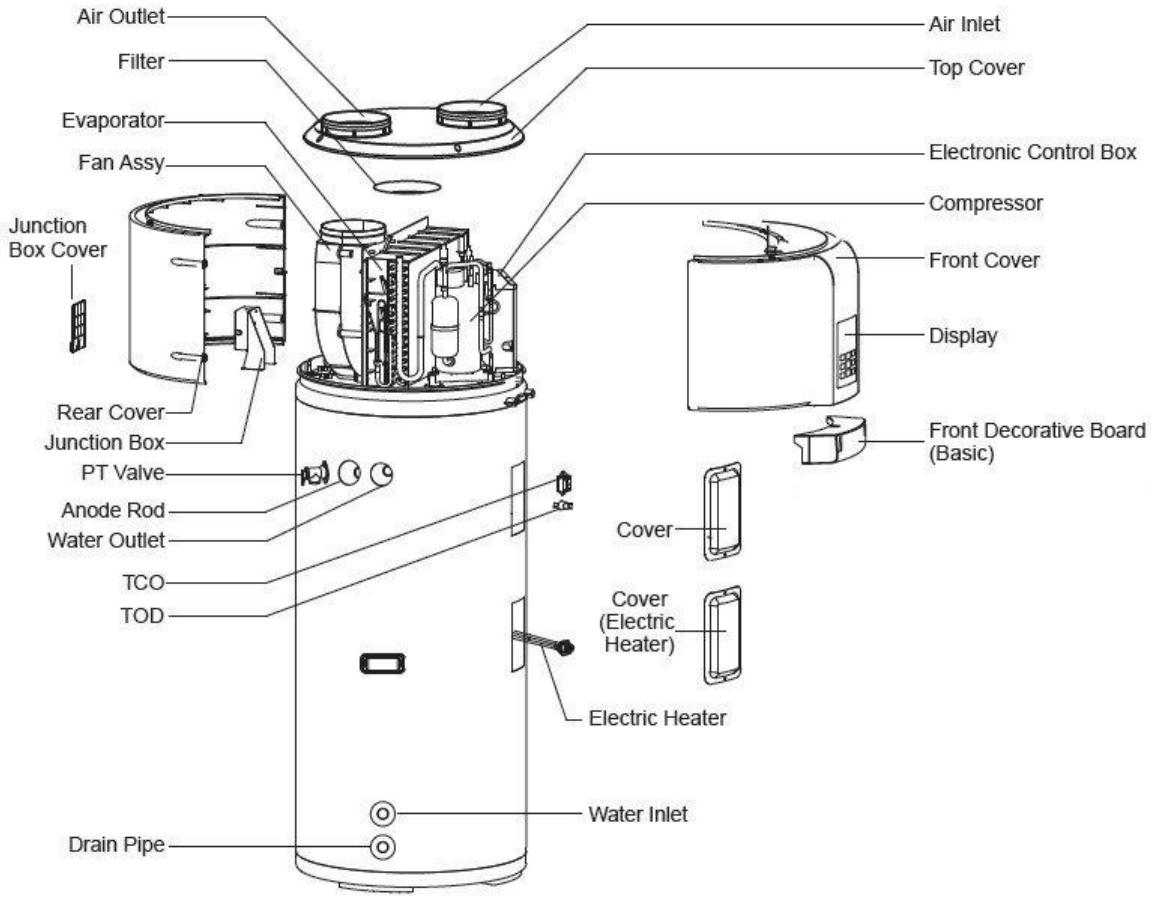
1) The circulating air for every unit should be more than 700m3/h.
2) Make sure there is enough Installation space.
3) Outline dimensional drawing

Unit Appearance and Composition

Model : SWH-15/190TL



Model : SWH-35/300TL



Accessories

Check whether the following assemblies are complete.

Accessory Name	Qty.	Sharp	Purpose
Owner's & Installation Manual	1		Installation and use instruction This manual
One Way Valve	1		Prevent water from flowing backwards
Pipe（short）for water condensation	1		Discharge condensated water
Drain pipe for water condensation	1		Discharge condensated water

Inspecting and Handling the Unit

After delivery, the package should be checked and any damage should be reported immediately to the carrier claims agent.

When handling the unit, take into account the following:

1. Fragile, handle the unit with care.

   Keep the unit upright in order to avoid compressor damage.
2. Choose before hand the path along which the unit is to be brought in.
3. Move this unit with original package.
4. When lifting the unit , always use protectors to prevent belt damage and pay attention to the balance of the unit's gravity.

Electric Wiring

1 Attention

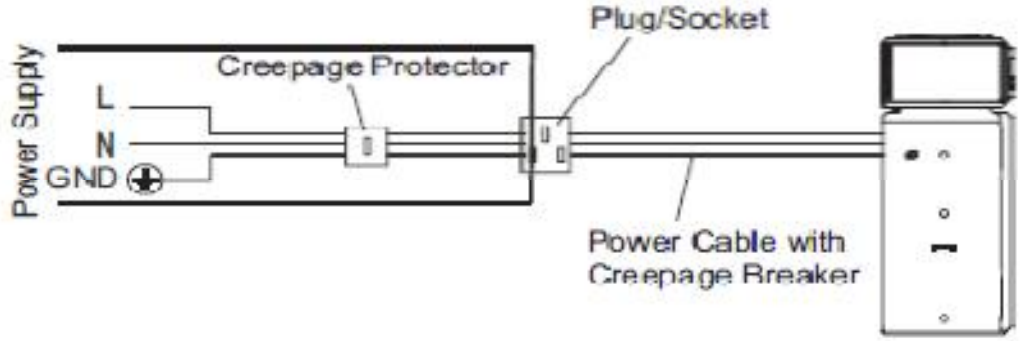
- The water heater should powered separately and the power voltage should be in line with rated voltage..
- The power supply circuit of the water heater should be earthed, the power cord should be connected with the external earthing line in reliable state and all the external earthing cables are effective.
- The construction of the wiring should be carried out by professionals in accordance with the circuit diagram.
- Set up leakage protection devices in accordance with the requirements of the relevant national technical standards.
- The power cord and the signal line should be laid neatly without cross-interfere and should not contact with the connecting pipe and the valves.
- The unit is not equipped with power cord. Please refer to the prescribed power specification for selecting the power cord and cross-connection between two lines are not allowed.
- Check whether all the connections are correct before powering the unit.

2 Power specification

Model	SWH-15/190TL	SWH-35/300TL, SWH-35/300TSL
Power Supply	220-240V ~ 50Hz	220-240V ~ 50Hz
Min Diameter of Power Supply cord (mm2)	4	4
Earth cord (mm2)	4	4
Manual switch(A)capacity / Fuse	25 / 20	25 / 20
Creepage Breaker	30 m A ≤ 0. 1sec	30 m A ≤ 0. 1sec

3 Power Supply Wiring .

A. Power Supply Schematic Diagram



Warming:

Although there is a leakage protector in the electric control box of the unit, for the security reason, it is required that a leakage protection equipped cable and Earthing should be applied for the unit according to the requirement on the above diagram.

B. Cable Diameter Selection

The power supply wiring refers to the wiring to the main line (a) of junction box and the wiring (b) to the power supply equipment. Please select the cable diameter according to the following methods

1) Diameter of the main line (a):

Get from the power supply specification table according to the sum of horsepower of the unit.

2) Diameter of the wiring from the junction box to the power supply equipment:

When the water heaters are less than 5 sets, the diameter the wiring from the junction box to the power supply equipment should be the same as the main line (a); when the water heaters are more than 6 sets, the power supply equipment should have two sets of electric control box and the diameter should be get from the power supply specification table according to the sum of horsepower of the units connected by the electric control box.

Confirmation Before the Trial Operation

1.1 All the installation is complete.

1.2 Water heater is installed correctly.

1.3 The pipelines and wiring are correct.

1.4 The accessories are installed correctly.

1.5 The drainage is smooth.

1.6 The thermal insulation is sound.

1.7 The earthing wire is connected correctly.

1.8 The power voltage is consistent with the rated voltage of the heater.

1.9 No obstacle at the air inlet and outlet of the unit.

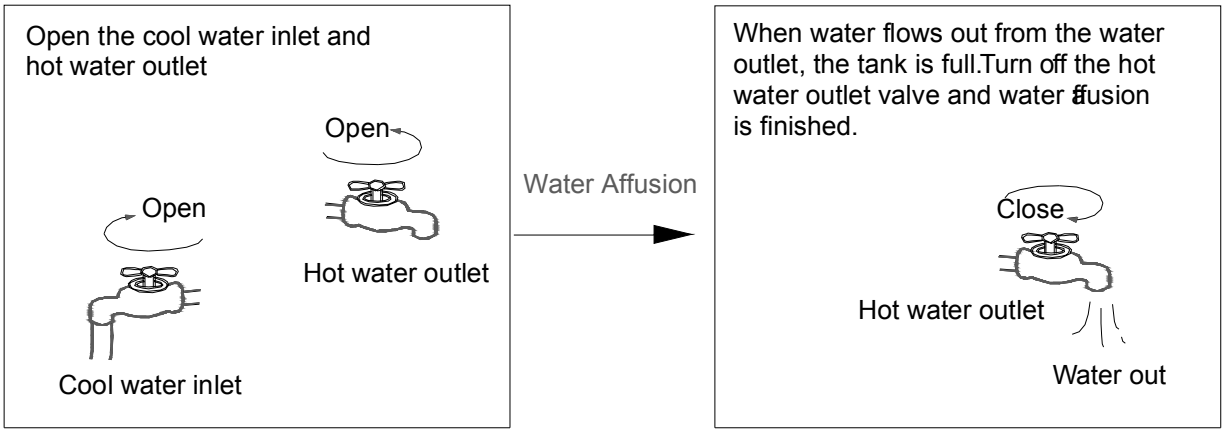
1.10 The leakage protector can work effectively.

Operating Instruction

1 Instruction

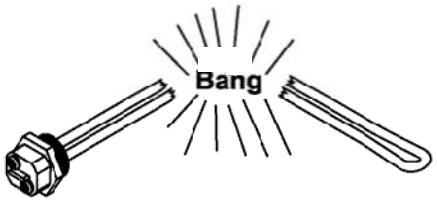
1.1 Before using this unit, please follow the steps below.

Water affusion: If the unit is used for the first time or used again after emptying the tank, please make sure that the tank is full of water before turning on the power. Method: see figure 2.1.1

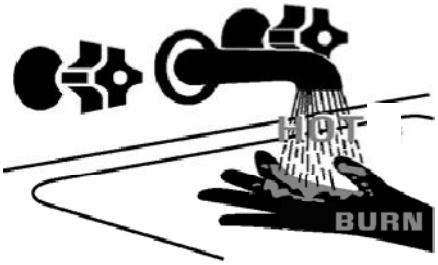


NOTE:

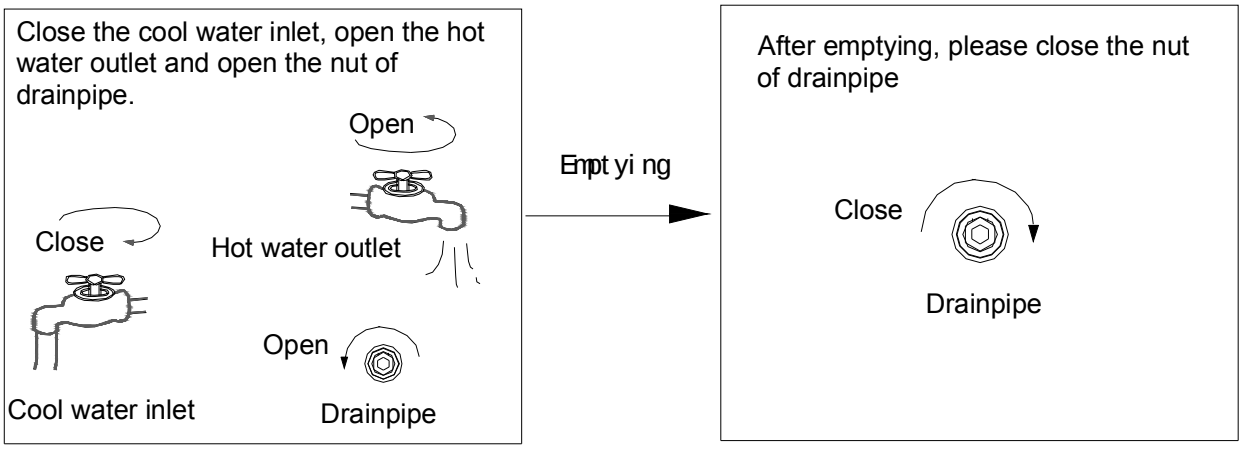
1. The Ball Valve at water inlet should be open when the unit is in operation.
2. Operation without water in water tank may result in damage of auxiliary e-heater. Due to such damage, the supplier is not responsible for the quality issue.



3. Over 50℃ may result in serious burn or so caused death. Special care should be paid to the children, the disabled and the old in case of water burn.



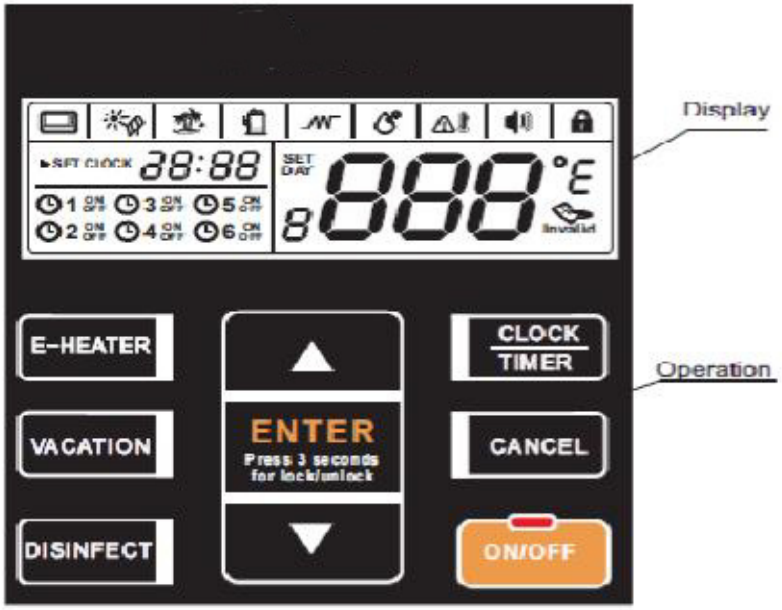
1.2 After powered on, the display lights up. Users can operate the unit through the buttons under the display for different modes. Emptying: If the unit needs cleaning, moving etc, the tank should be emptied. Method: See Figure 2.1.2



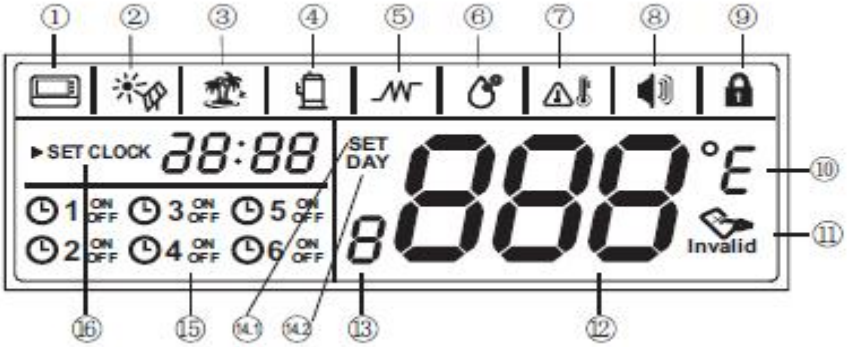
NOTE: The outlet water temp. may be very high when emptying, beware of your body for burns.

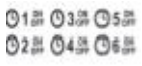
2 Operation

2.1 Control Panel Explanation



2.2 Display Explanation



Icon	Description
	Wire controller: If connected a wire controller, it will be lightened; otherwise it will be extinguished
	Outside solar heat source: If an outside solar heat source has been connected to the unit, it will flash with 1 Hz frequency; otherwise it will be extinguished.
	Vacation mode: This icon will be lightened if the unit is under vacation mode and flash with 2Hz frequency when setting vacation mode.
	Compressor: This icon will be lightened when compressor is running, otherwise it will be extinguished.
	E-heater: This icon will be lightened if e-heater is activated, otherwise it will be extinguished. If e-heater is automatically activated by unit, it will be lightened; If e-heater is manually activated, it will flash with 1Hz frequency. When setting e-heater manually ON/OFF, it will flash with 2 Hz frequency.
	Disinfect: This icon will be lightened when the unit is under disinfect mode, otherwise it will be extinguished. This icon will be lightened if disinfect mode is automatically activated by unit; it will flash with 1Hz frequency, if disinfect mode is manually activated; it will flash with 2Hz frequency when setting disinfect mode or setting disinfect timer.
	High temp. Alarm If setting water temp. is higher than 50℃ ,it will be lightened, otherwise will be extinguished.
	Alarm: When unit is under protection/error, it will flash, it with 5Hz frequency as well as buzzer will sound 3 times every 1 minute until protection/error eliminated or press for cancel button 1 second
	Lock: If button is locked, this icon will be lightened, otherwise it will be extinguished.
	Temperature unit If setting temperature unit as Celsius, ℃will be lightened; If setting temperature unit as Fahrenheit, ℉will be lightened
	If button is under lock mode, press any button except unlock button, this icon will be lightened
	This icon will be lightened if screen is unlocked. It shows water temperature on normal mode; It shows remaining vacation days on vacation mode; It shows setting temperature under setting mode; It shows unit setting/running parameters, error/protection code under query mode
	Reserved
SET	**Water Temperature setting** This icon will be lightened when setting water temperature or setting days for vacation.
DAY	**Date setting** This icon will be lightened when setting days for vacation; It will be lightened when under vacation mode.
	**Timer** There are six timers can be set. If anyone of them has been set, this icon will lighten the corresponding one when screen is unlocked ; If there is none of timer has been set, it will keep extinguished. If timer is being set, the icon will flash the corresponding one with 2HZ frequency as well lighten the timer which has been set.
	Clock and clock setting This icon shows the clock. Whenever there is any setting for clock, it will be lightened.

2.3 Operation Instruction

2.3.1 Preparation before running the unit.

a) When you run the unit for the first time, all the indicators on the UI will light for 3 second, and the buzzer will “didi” ring twice at the same time, and then, display the fiducially web page. After no operation for 1 minute, button will be locked except Unlock button( ), Press for 3s, unlock buttons.

b) When the tank is full and make sure all settings finished, please press the ON\OFF key and then run the unit.

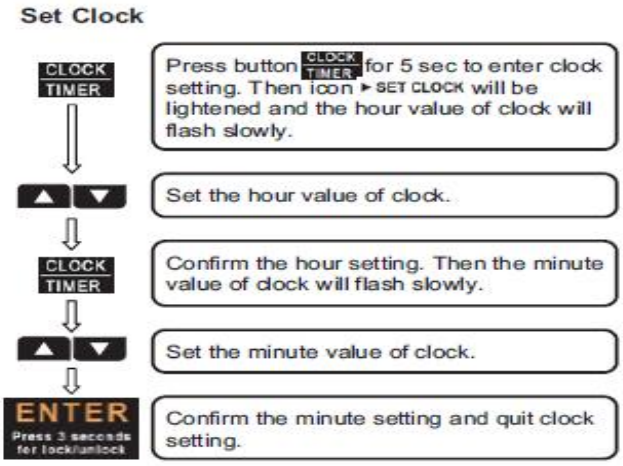
c) When the unit is running, if there is no operation or malfunction for 30s, screen will be locked (extinguished) except for error code and alarm light. Press any button will unlock the screen(lighten).

2.3.2 Lock and Unlock

In order to prevent wrong operation, a special lock function has been designed. If there is no operation for 1min, the unit will be locked automatically, and display the lock sign (Lock indicator lights up).When the unit is locked, no keys can be operated.

2.3.3 Clock Setting

The clock is for a 24-hour system and the initial time is 00:00. To make a better use of this unit, it is recommended to set the time for accurate local time. Every time powered off, the clock will be reset to the initial time 00:00.Method for time set



2.3.4 Mode Selection

a) The unit is enhanced with four operation modes, Economy Mode, Vacation, Disinfect and E-heater Mode.

b) Economy Mode: After pressing " Economy " button, the unit heats water only by compressor drive according to heat-pump principle. Used when the ambient temp. is high.

c) E-heater Mode: After pressing " E-heater " button, the unit heats water only by electric heater. Used when the ambient temp. is very low.

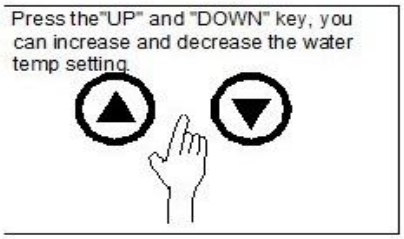
d) Vacation Mode: After pressing "Vacation" button, the unit will automatically heat water to 15℃ for the purpose of energy saving during vacation days.

e) Disinfect Mode: After pressing " Disinfect " button, the unit immediately start to heat water up to 65□ to kill the potential legionella bacteria inside water of tank.

2.3.5 Temperature Setting

Temp displayed is the water temp. in the upper part of the tank. Default is 55℃.

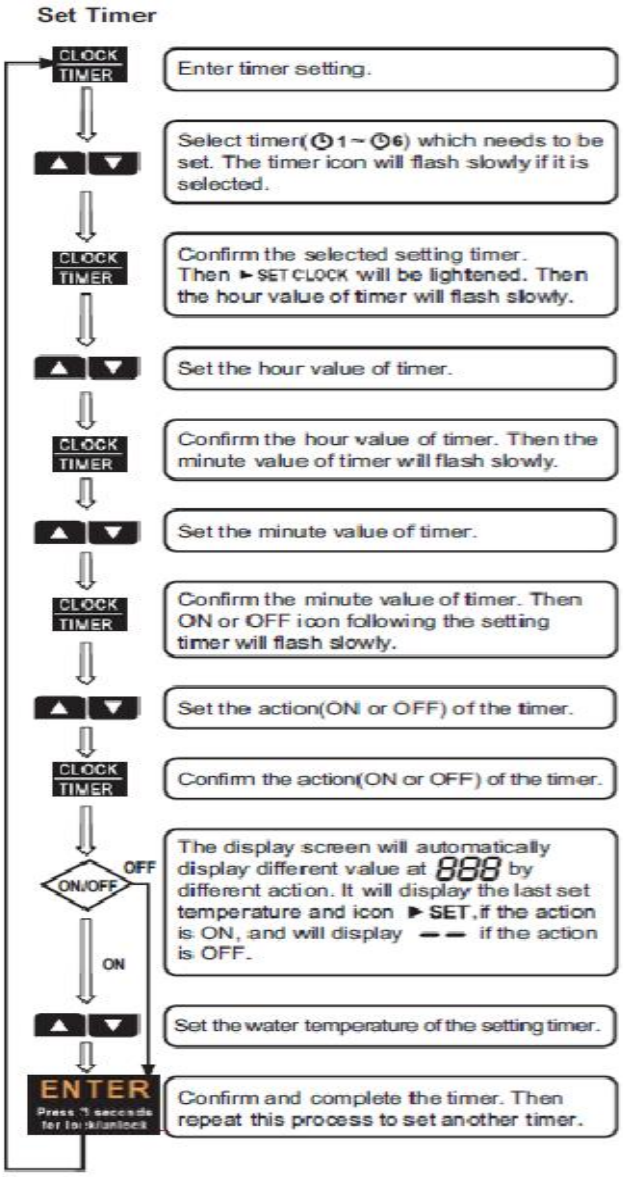
Method for set.



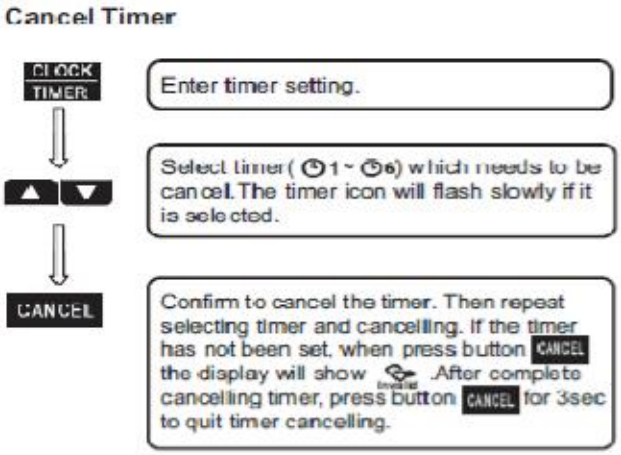
2.3.6 TIMER

User can set up a running start time and a stop time on a specifically by the timer function. The least numbers of timer is ten minutes. Time on: User can set up a start time by this. The unit will auto run one time between the set time and 24:00 on the same day.

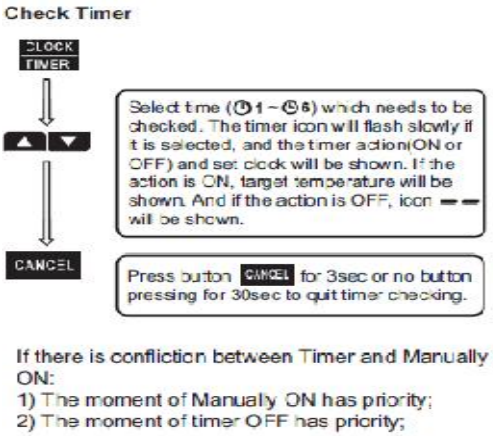
Method for set.



CANCEL:

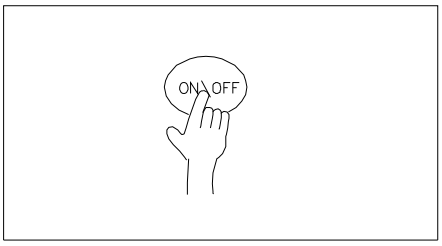


CHECK:



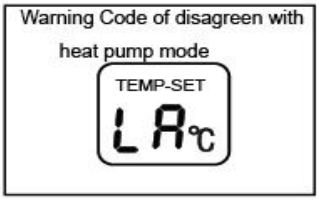
2.3.7 Power On and Power Off

Press “On/ Off” button after all the above have finished and the system will run as the setting. And simply press the same button to stop it.



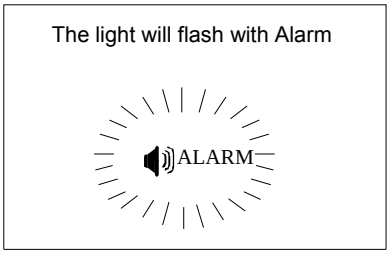
2.3.8 Operation status

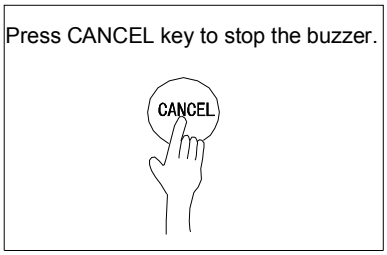
The LA code from the screen of set Temp. will appear and remind user when ambience temp. not meet the operation condition of heat pump unit(beyond -7～43℃) , User can switch the economy mode to E-heating mode in sure of enough volume of hot water if need, The unit will return operation pre-status automatically in no any operation when the ambient temp. meet the operation condition of heat pump mode and the error LA will be disappear at the same time, the screen display normally.



2.3.9 Error Shooting

If some errors happen, the buzzer will buzz 3 times every other minute and the error indicator will glitter fast. Press CANCEL for several seconds to stop the buzzer but the light will keep glittering.





When error happens, though the system could be used in some circumstances, it could not reach the expected efficiency. Please contact your supplier for help. Error Code Explanation (See table below table)

Display	Malfunction Description	Display	Malfunction Description
E0	Error of sensor T5U	P1	System high pressure protection ≥2.76MPa active ; ≤2.07Mpa inactive
E1	Error of sensor T5L	P2	High discharge temp. protection Tp>115℃ , Protection active Tp<90℃ , Protection inactive
E2	Tank and Wired Controller communication error	P3	Compressor abnormally stopped protection The discharge temperature is not so higher than evaporator temperature after compressor running a term.
E4	(T3) Condenser output pipe temperature sensor error	P4	Compressor overloaded protection (10 sec after compressor startup, Current checking starts , 1)only compressor running, if it is >7A , the compressor will be stopped and protected.) 2)Compressor+ e-heater opened, if it is >IEH+7,the compressor will be stopped and protected.)
E5	(T4) Outdoor ambient temperature sensor error	LA	When the ambient temp is out of Heat Pump running zone [-7 ~ 43℃],Heat Pump will stop ,then LA protection code will appear, and ALARM indicator flashes if the condition maintain more than 20hr, Need to switch to Enhanced heating Mode.
E6	(Tp) Comp. discharge Sensor error	E9	Compressor suction temperature sensor TH error
E7	Heat Pump system error If any of P3/P4/P2/P1 continuously appear 3 times within single heating cycle, system will consider it as “Heat Pump system error”		
E8	Electric leakage error If PCB current induction circuit check the current difference between L,N >14mA, system consider it as” electric leakage error”		

3 Running and Operating

2.3.1 Trial Running

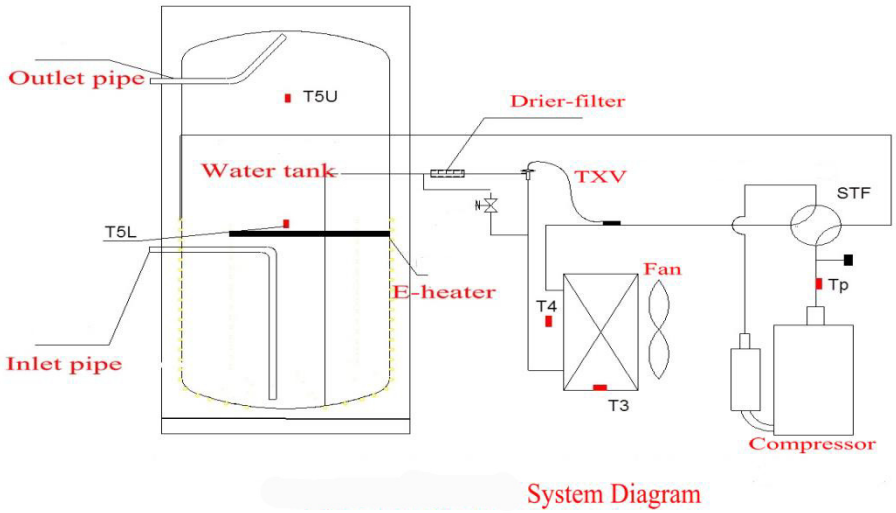
1) Before running, please check the following items first:
2) Correct installation of the system;
3) Correct connection of pipeline and wiring;

4) Leakage of the refrigerant pipeline tested;
5) Efficient drainpipe;
6) Complete insulation protection;
7) Correct earthing;
8) Correct power supply;
9) No obstacle outside the air inlet and outlet;
10) No air in the water pipeline and all valve opened;
11) Effective electric leakage protector;
12) Sufficient inlet water pressure(≥0.15MPa)

4 Refrigerant figure

System Piping figure

Model : SWH-15/190TL



System Diagram

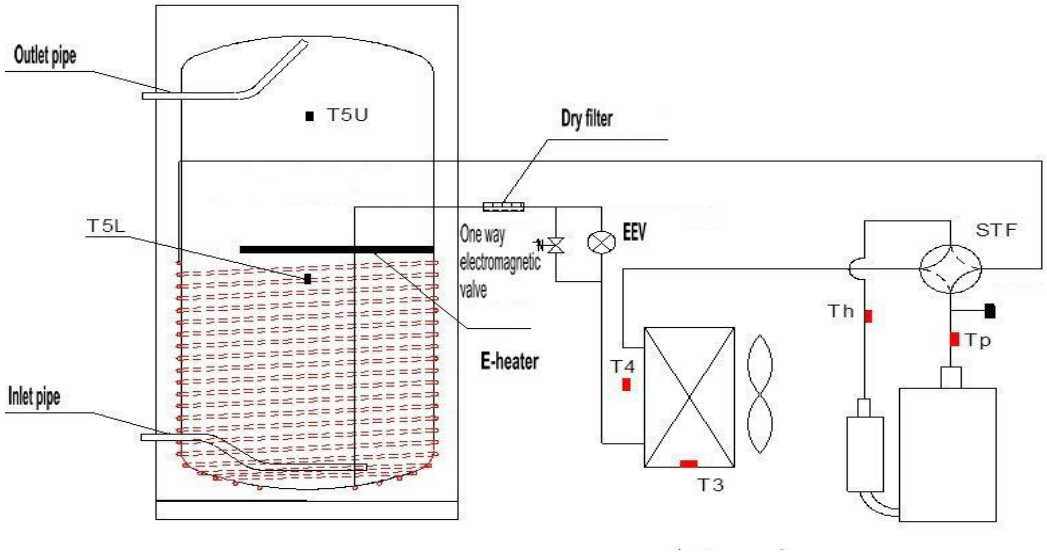
Compressor: GMCC PJ125G1C-4DZDE, R134a ; **E-heater:** located in the mid of tank, 3000W/230VAC;

TCO (Temp. Switch): when water Temp. > 80, switch OFF, when water Temp. < 60, switch ON;

High Pressure Switch: switch OFF when 2.76MPa; switch ON when 2.07MPa;

Fan: Centrifugal type, 220V—240V/50Hz , 3 Speeds;

Model: SWH-35/300TL, SWH-35/300TSL



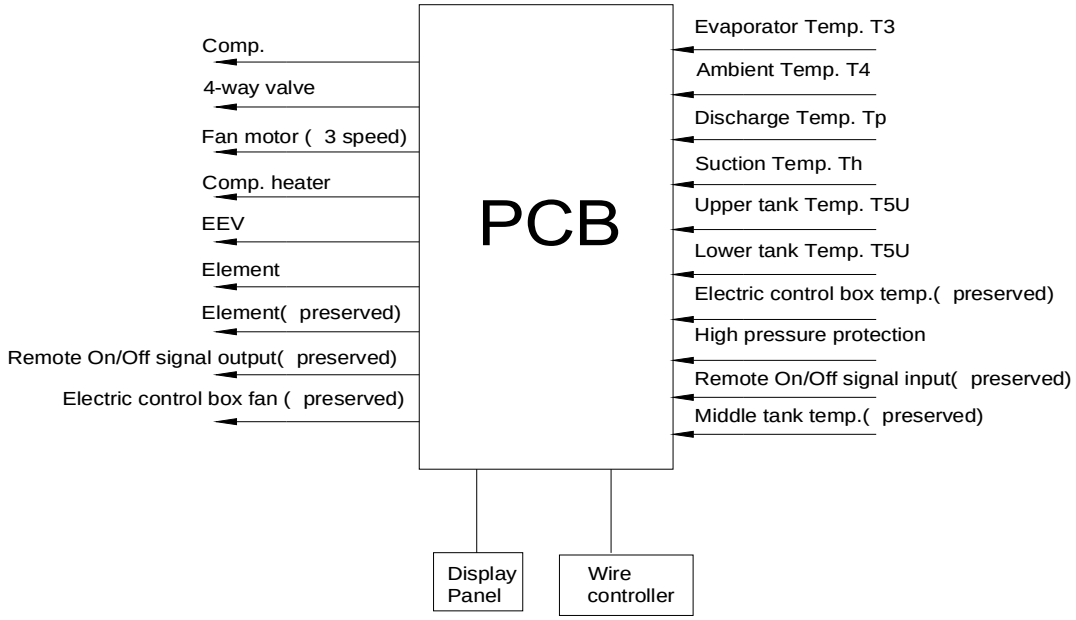
Compressor: Mitsubishi RB233GRDC, R134a ; **E-heater:** located in the mid of tank, 3000W/230VAC;

TCO (Temp. Switch): when water Temp. > 80, switch OFF, when water Temp. < 60, switch ON;

High Pressure Switch: switch OFF when 2.76MPa; switch ON when 2.07MPa;

Fan: Centrifugal type, 220V—240V/50Hz , 3 Speeds;

4.2 System I/O figure

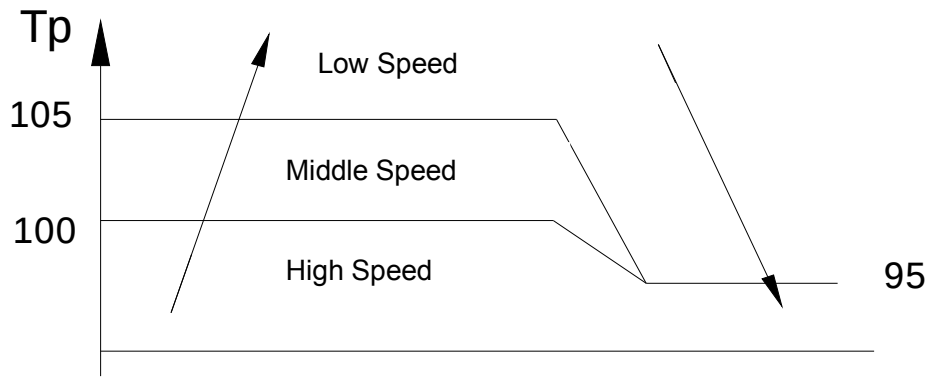


4.3 Fan motor speed control

Fan motor speed has 3 levers, High, Middle, Low speed;

Fan motor will start with high speed 30s in advance of the start of compressor;

After staring, Fan motor speed will be regulated by Tp (Compressor discharge temperature) with following logic



Fan motor will stop 30s behind of the stop of compressor

4.4 Defrosting during Water-heating

Conditions to activate defrosting cycle

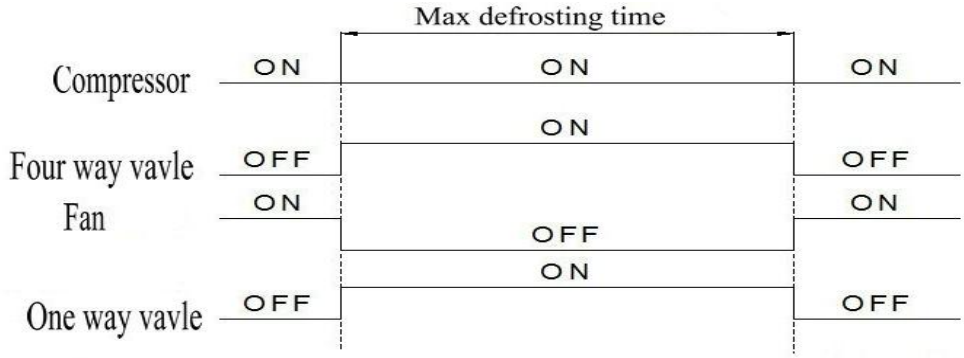
When T3 ≤0℃, Comp. is continually running for 40min

(If Comp. restart frequently, which can only run within 10 min. for each start cycle, system will count accumulated running time, when accumulated running time reaches 40min, defrosting cycle will activate 2 min. after Compressor's next start

Conditions to inactivate defrosting cycle (when achieve any one of following conditions)

1. Defrosting time reaches 10 min;
2. T3≥15℃;

Main components' movement when defrosting



4.5 Ambient Temperature

a) The system's operation temperature is within -30~43℃ and below are the operation temperature for each mode.

b) Economy Mode: -7~43°C

c) E-heater Mode: -30~43°C

4.6 Self-Protection Detection

a) When the self-protection happens, the system will be stopped and start self-check, and restart when the protection resolved;

b) When the self-protection happens, the buzzer will buzz in every other minute, the Warning indicator glitter and the display indicate the error code and water temperature alternatively. Press CANCEL button for 3sec to stop the alarm. All stop when he protection is resolved and error code disappears on the display.

c) In the following circumstances, self-protection starts:

Air inlet or outlet is obstacles;

The heat exchanger is covered with too much dust;

Incorrect power supply (exceeding the range of 220±10%)

NOTE: When self-protection happens, cut the power supply manually and restart after the error resolved.

4.7 Water Temperature Display

a) The temperature on the display is the water temperature in upper part of water tank (over 1/4) which you will use, but not that of all the water.

b) In water using, the temperature of the lower part may decrease while the upper part still keeps a high one, and the system will start heating the lower part. And it is normal.

Error Shooting

a) When common error happens, the system enters Standby Mode and could still work, but not so efficient as normal. Please contact the technician.

b) When serious error happens, the system will be unable to carry on. Please contact the technician.

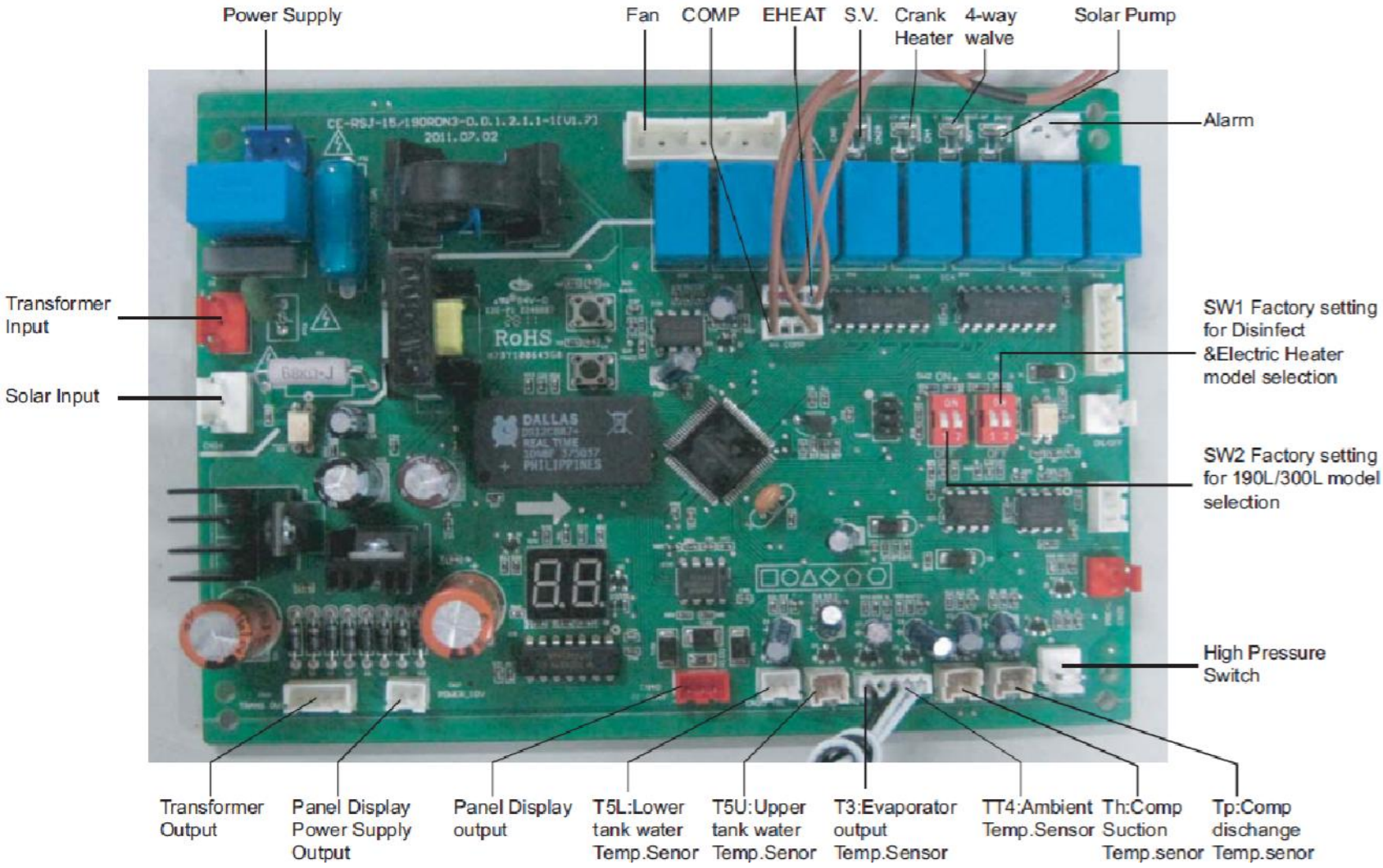
c) When error happens, the buzzer will buzz in every other minute, the Warning light glitter and the display indicate the error code and water temperature alternatively. Press CANCEL button for 3sec to stop the alarm.

4.8 Restart after Long Stop

When the system is started after a long time (trial running included), it is normal if the outlet water is unclean. Keep the tap on and it will be clean soon.

PCB explanation

PCB I/O Ports description



SW1/SW2 SETTING

SW1	Model selection (User never allow to alter the factory settings)	
	ON	OFF
SW1－1	Without Electric Heater	With Electric Heater
SW1－2	Without Disinfect	With Disinfect

Table. 3-5

SW2	Model selection (User never allow to alter the factory settings)	
2 / 1	190L model	300L model

- Default factory setting is:

SW1

SW2

Self-checking function

For the convenience of maintenance and debug, query function is available by Press 2 buttons together: " CANCEL " + " CLOCK TIMER " ,then system running parameters will be shown one by one with following sequence by each pushing of " ▲ " or " ▼ " button.

No.	Hour low bit	Min. high bit	Min. Low bit	Temp./ Dasys	Explenation
1		5	U	Temp.	T5U
2		5	L	Temp.	T5L
3		t	3	Temp.	T3
4		t	4	Temp.	T4
5		t	P	Temp.	TP
6		t	h	Temp.	Th
7		C	E	Current	Compressor
8	1				Last error code
9	2				Previous 1st error or protection code
10	3				Previous 2nd t error or protection code
11					Software number

Maintenance

1 Maintenance

1.1 Check the connection between power supply plug and socket and ground wiring regularly;

1.2 In some cold area (below 0℃), if the system will be stopped for a long time, all the water should be released in case of freezing of inner tank and damage of e-heater.

1.3 It is recommended to clean the inner tank and e-heater regularly to keep an efficient performance.

1.4 Check the sacrificial anode every half year and change it if it has been used out. For more details, please contact the supplier or the after-sale service.

1.5 It is recommended to set a lower temperature to decrease the heat release, prevent scale and save energy if the outlet water is sufficient.

1.6 Clean the air filter every month in case of any affect on the heating performance.

1.7 Before shutting the system down for a long time, please: Shut down the power supply; Release all the water in water tank and the pipeline and close all the valves; Check the inner components regularly.

2 Non-error Malfunction

2.1 3-min Protection With the power supplied, an immediate restart after the shutting down will have to wait 3 min as to protect the compressor.

2.2 If self-protection happens and the system stops, check :

When the power indicator lights up, if the system is forced to run while startup requirement has not been met; If the air outlet or inlet is jammed or strong wind blows to air outlet.

2.3 Defrosting

When it is humid and cold, the condenser may defrost and the water-heating capacity decrease. And the system will stop heating water and start defrosting and then restart water-heating

2.4 During defrosting, the compressor keeps running but reverse to defrosting cycle while fan motor stops;

2.5 The defrosting time varies from 3min to 10min according to the ambient temperature and the frost.

3 Temperature Display

3.1 When the system stops, a decrease of the temperature is normal as heat released. When it decreases to some point, the system will restart automatically;

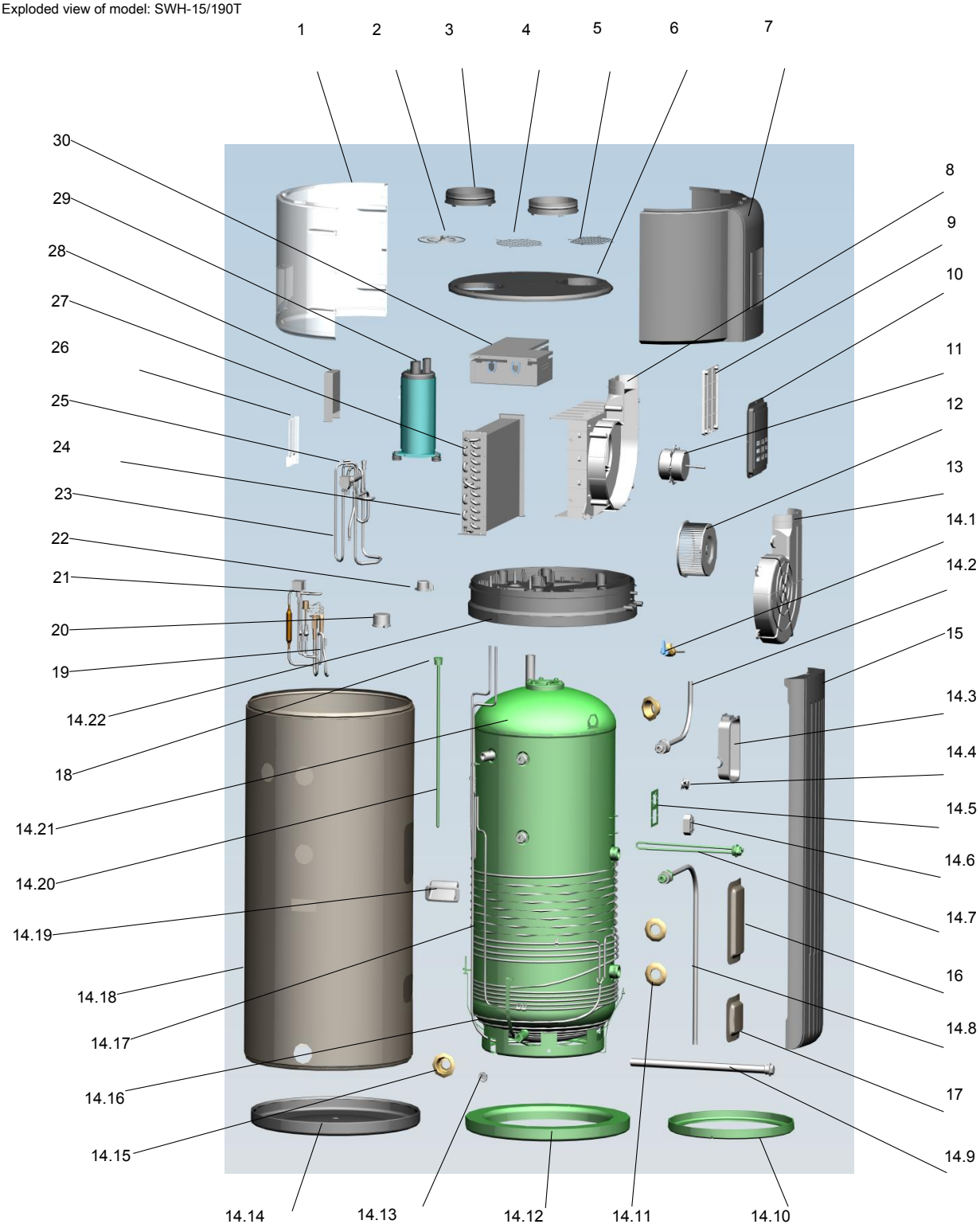
3.2 During water-heating, the displayed water temperature might still decrease or not increase for a period of time because of the heat exchange of the water. When the whole tank of water has reached the set temperature, the system will stop automatically.

Malfunctions and Resolutions

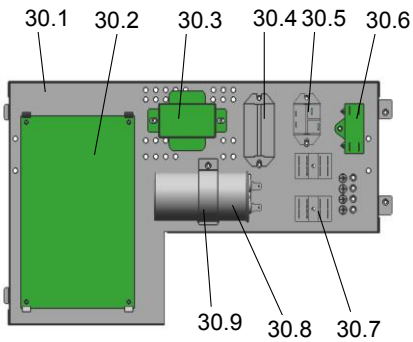
Malfunction	Cause	Resolutions
Outlet water is cold. The display is dark.	Bad connection of power supply plug and socket; Outlet water is set an a low temperature; Outlet water temperature controller is damaged; Circuit board of indicating indicator is damaged;	Reconnect the plug; Set outlet water an a higher temperature; Contact the technician.
No hot water from the outlet.	Tap water has been cut away; Water pressure is too low; Inlet valve has been closed.	It'll return to normal after water supplied; Use it when the pressure is higher; Open the inlet water valve.
Water leakage	The joints on the pipeline are not sealed well.	Check and reseal all the joints.

If the unit occurs any malfunction or error, please shut down the system, turn off the power supply, and consult your service persons for help.

Exploded view of model: SWH-15/190T



(D)



No	Description	Part Code	Note	Qty	Price Code
MODEL: SWH-15/190T					
1	After the cover on	201190590316		1	
2	Filter	201190590315		1	
3	The wind ring	201190590320		2	
4	Net	201290590261		1	
5	Barbed wire	201290590169		1	
6	Top cover	201190590317		1	
7	The front cover	201190590302		1	
8	Before the spiral	201190590304		1	
9	Display cover	201190590297		1	
10	Display Panel	201190590318		1	
11	Motor	202400401229		1	
12	Centrifugal wind wheel assembly	201100100207		1	
13	After scroll	201190590305		1	
14	Tank foam components	201290590249		1	
14.1	Temperature and pressure safety valve	201601690004		1	
14.2	Water outlet pipe	201690590512		1	
14.3	Electric heating foam baffle	201190500336		1	
14.4	Thermometer	202301600046		1	
14.5	Stator of temp. sensor	201290590034		1	
14.6	Temp sensor	202301610028		1	
14.7	Electric heating pipe water	202403101226		1	
14.8	Water inlet pipe	201690590513		1	
14.9	Magnesium anode	202990290829		1	
14.11	Froth plug	201190590026		1	
14.12	Foam	202290500000		1	
14.13	Drain plug	201690590514		1	
14.14	Tank bottom	201290590116		1	
14.15	PT velve loop	201190500274		2	
14.16	The bottom of the coil	201690590356		1	
14.17	Coil	201690590515		1	
14.18	Water tank outer shell	201290590254		1	
14.19	Water tank handle	201156100067		2	
14.20	Sensor pipe	201290590256		1	
14.21	Inner container	203690590004		1	
14.22	Water tank top cover	201190590255		1	
15	Front decorative boards	201190590299		1	
16	Top heater cover	201290502782		1	
17	Bottom heater cover	201290590262		1	
18	Temp.sensor ass'y	202301300613		1	
19	Temp.sensor ass'y	202301300442		1	
20	Temperature control waterproof cover	201156100028		1	
21	Expansion valve	201690590516		1	
22	Wire cover	201190590293		1	
23	4-way valve	201690590523		1	
24	Evaporator ass'y	201590590028		1	
25	Discharge temp sensor ass'y	202301390002		1	
26	Junction box cover	201190590319		1	
27	Room temp sensor ass'y	202301300196		1	
28	Junction box ass'y	203390590082		1	
29	Compressor	201400602940		1	
30	E-part box ass'y	203390590081		1	
30.1	E-part box	201290590258		1	
30.2	Main control board	201390590052		1	
30.3	Transformer	202300900109		1	
30.4	Dual Relay	202300830544		1	
30.5	Relay	202300800003		2	
30.6	Insert motor capacitor	202401190041		1	
30.7	Wire joint,2p	202301400220		2	
30.8	Compressor capacitor	202401000410		1	
30.9	Capacitor clamp	201200100005		1	

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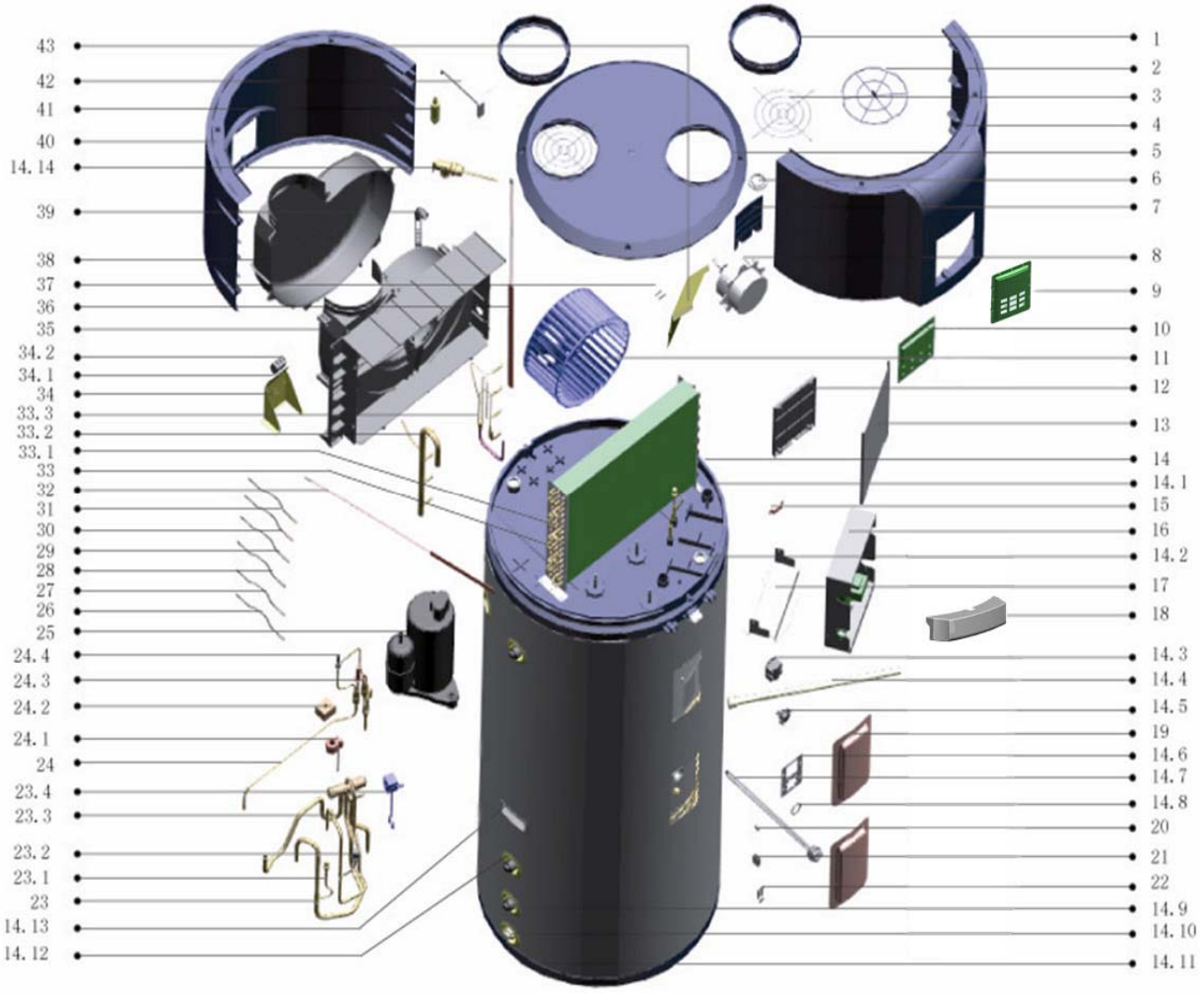
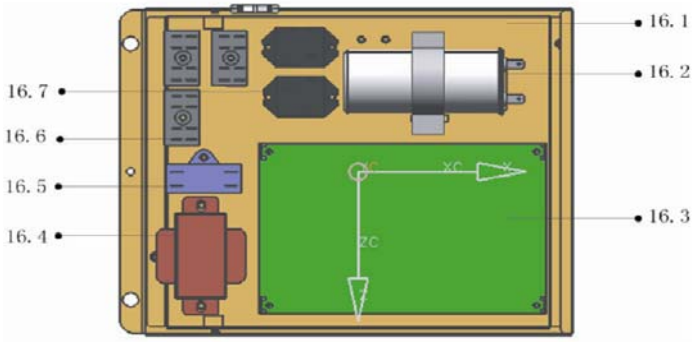
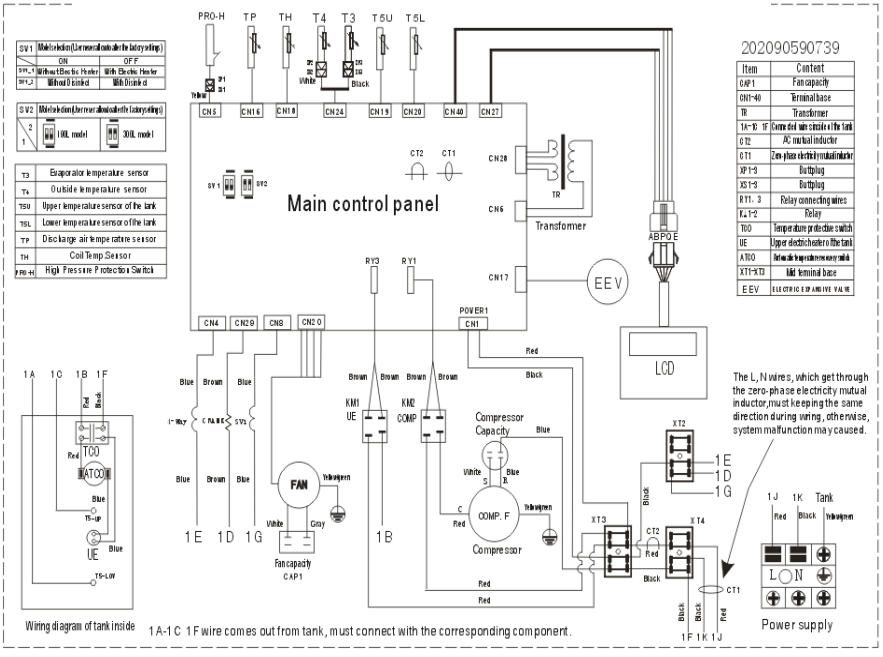




T3	Evaporator temperature sensor
T4	Outside temperature sensor
T5U	Upper temperature sensor of the tank
T5L	Lower temperature sensor of the tank
TP	Discharge air temperature sensor
TH	Coil Temp.Sensor
PRO-H	High Pressure Protection Switch

Item	Content
CAP1	Fan capacity
CN17-40	Terminal base
TR	Transformer
1A~1F	Connected wire circuit of the tank
CT2	AC mutual inductor
CT1	Zero-phase electricity mutual inductor
XP1-3	Buttplug
XS1-3	Buttplug
RY1、3	Relay connecting wires
K_1-2	Relay
TCO	Temperature protective switch
UE	Upper electric heater of the tank
ATCO	Automatic temperature sensing switch
XT1~XT3	Idol terminal base
EEV	ELECTRIC EXPANSIVE VALVE



No	Description	Part Code	Actualization	Qty	Price Code
MODEL: SWH-35/300TL, SWH-35/300TSL					
1	The wind ring	201190590033		2	
2	Filter	201190590030		1	
3	Net	201290590058		2	
4	The front cover	201190590311		1	
5	Cover	201190590039		1	
6	Magnesium rod plug	201190500258		1	
7	Junction box cover	201190590034		1	
8	Motor	202400400568		1	
9	Display panel	201190590325		1	
10	Display board ass'y	201390590053		1	
11	Centrifugal fan	201100100803		1	
12	Display cover	201190590314		1	
13	E-Part box cover	201290590061		1	
14	Tank foam components	201290590208		1	
14.1	Tank cover assembly	201190590322		1	
14.2	Froth plug	201190500257		2	
14.3	Temp sensor	202301610028		1	
14.4	Magnesium anode	202990590003		1	
14.5	Thermometer	202301600046		1	
14.6	Stator of temp. sensor	201290590034		1	
14.7	Electric heating pipe water	202403101226		1	
14.8	seal ring of radiation pipe	202790590001		1	
14.9	Seal Stopper	201170390002		2	
14.10	Drain plug assembly	201690503031		1	
14.11	Tank bottom cover	201290590067		1	
14.12	PT velve loop	201190500274		5	
14.13	Water tank handle	201190590042		2	
14.14	Temperature and pressure safety valve	201601690004		1	
15	Magnet frame	201290590057		1	
16	E-part box ass'y	203390590085		1	
16.1	E-part box	201290590083		1	
16.2	Compressor capacitor	202401000508		1	
16.3	Main control board ass'y	201390590070		1	
16.4	Transformer	202300900109		1	
16.5	Motor capacitor	202401190019		1	
16.6	Wire joint	202301450122		3	
16.7	Relay	202300800003		2	
17	Electronic Control Box Bracket	201290590060		1	
18	Deck board	201190590337		1	
19	On the heater cover	201290590059		2	
20	Deck magnet	201290501174		2	
21	Magnet clip	201290501166		4	
22	Magnet cover	201290501165		2	
23	4-way valve ass'y	201690590198		1	
23.1	Pipe joint	201601200002		1	
23.3	4-way valve	201600600115		1	
23.4	Solenoid	201600600212		1	
24	Electronic expansion valve ass'y	201690590194		1	
24.1	EEV solenoid	201601300107		1	
24.2	Solenoid valve winding	201600600214		1	
24.3	Electronic expansion valve	201601300524		1	
24.4	Solenoid valve	201600600081		1	
25	Compressor	201401500040		1	

No	Description	Part Code	Actualization	Qty	Price Code
MODEL: SWH-35/300TL, SWH-35/300TSL					
26	Discharge temp sensor ass'y	202301300130		1	
27	Room temp sensor ass'y	202301300196		1	
28	Temp.sensor ass'y	202301300437		1	
29	Temperature sensor	202301300303		1	
32	Compressor electric heater DJRD-390A-1500-2*250Z	202403100155		1	
33	Evaporator ass'y	201590590012		1	
33.1	Evaporator	201590590013		1	
33.2	Evaporator output pipe ass'y	201690590214		1	
33.3	Evaporator input pipe ass'y	201690590206		1	
35	Before scroll	201190590032		1	
36	Compressor wire joint ass'y	202490501116		1	
37	Screw plate	201290590082		2	
39	Drain	201190590292		1	
40	Rear net	201190590038		1	
41	Dry Filter	201600900702		1	
42	Plumbing fixture	201290590098		1	
43	Electronic control box panels	201290501297		1	

The data are subject to change without notice.